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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : A61K 7/00, 7/021, 7/025, 7/06, 7/09, 7/16, 7/32, 7/42, 31/74		A1	(11) International Publication Number: WO 98/48768 (43) International Publication Date: 5 November 1998 (05.11.98)
(21) International Application Number: PCT/US98/08931 (22) International Filing Date: 1 May 1998 (01.05.98) (30) Priority Data: 08/846,883 1 May 1997 (01.05.97) US (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application: 08/846,883 (CON) Filed on 1 May 1997 (01.05.97) (71) Applicant (for all designated States except US): MEDLOGIC GLOBAL CORPORATION [US/US]; 4815 List Drive, Colorado Springs, CO 80919 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): RON, Eyal, S. [US/US]; 7 Coach Road, Lexington, MA 02173 (US). HAND, Barry, J. [US/US]; 145 Butternut Hollow, Acton, MA 01718 (US). BROMBERG, Lev, S. [US/US]; 17 Sherwood Road, Swampscott, MA 01907 (US). KEARNEY, Marie [US/US]; 342 Faneuil Street #1, Brighton, MA 02135 (US). SCHILLER, Matthew, E. [US/US]; 23C Sagamore Way, Waltham, MA 02154 (US). AHEARN, Peter, M. [US/US];		63 Webster Street, Whitman, MA 02382 (US). LUCZAK, Scott [US/US]; 3 Remsen Avenue, Medfield, MA 02052 (US). MENDUM, Thomas, H. E. [US/US]; 45 Columbus Avenue #1, Somerville, MA 02143 (US). (74) Agents: KREBS, Robert, E. et al.; Burns, Doane, Swecker & Mathis, L.L.P., P.O. Box 1404, Alexandria, VA 22313-1404 (US). (81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).	

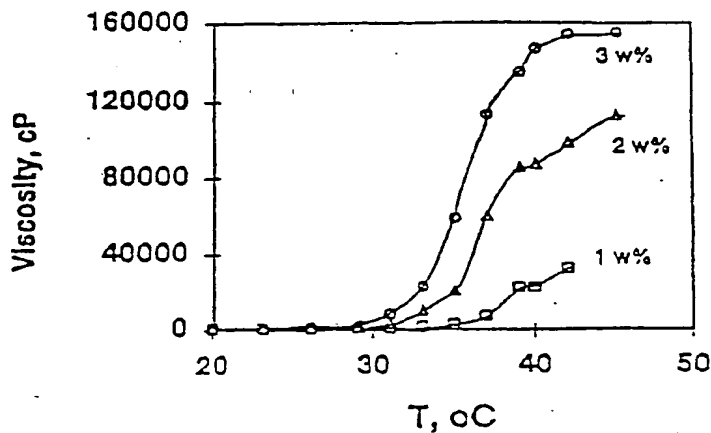
Published

With international search report.  
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: COMPOSITIONS FOR COSMETIC APPLICATIONS

(57) Abstract

A cosmetic composition is described having a cosmetically acceptable carrier, comprising a reverse thermal viscosifying polymer network comprising at least one poloxamer component capable of aggregation in response to a change in temperature randomly bonded to at least one poly(acrylic acid) component; and a cosmetically active agent which imparts a preselected cosmetic effect, said carrier and said agent disposed within an aqueous-based medium.



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COMPOSITIONS FOR COSMETIC APPLICATIONS*to be added*

5 This application is a continuation-in-part application of copending application  
U.S.S.N. 60/034,805 filed January 2, 1997, and entitled "Responsive Polymer  
Networks and Methods of Their Use", which is a continuation-in-part application of  
copending application PCT/US96/10376 filed June 14, 1996, designating the United  
States, and entitled "Responsive Polymer Networks and Methods of Their Use", which  
is a continuation-in-part application of copending application U.S.S.N. 08/580,986 filed → US 5,939,488  
10 January 3, 1996, and entitled "Responsive Polymer Networks and Methods of Their  
Use", each of which is incorporated entirely by reference.

Field of the Invention

15 The present invention relates to a cosmetic composition useful in a variety of  
topical and personal care products, including treatments of disorders and imperfections  
of the skin or other areas of the body. More particularly, the present invention is  
directed to a cosmetic composition comprising a poloxamer-poly(acrylic acid)  
polymer network that can be designed to reversibly gel over a wide range of  
conditions to provide a composition having a controllable range of viscosities, making  
20 it useful in a variety of cosmetic and personal care applications.

Background of the Invention

Many examples are known of cosmetic compositions intended for treatment of  
the skin or elsewhere on the body, where it is desired to have certain properties of  
25 viscosity. Hydrogels, such as cellulose, have been included as thickeners in cosmetic  
compositions. A hydrogel is a polymer network which absorbs a large quantity of  
water without the polymer dissolving in water. The hydrophilic areas of the polymer  
chain absorb water and form a gel region. The extent of gelation depends upon the  
volume of the solution which the gel region occupies.

30 Reversibly gelling solutions are known in which the solution viscosity increases

and decreases with an increase and decrease in temperature, respectively. Such reversibly gelling systems are useful wherever it is desirable to handle a material in a fluid state, but performance is preferably in a gelled or more viscous state.

A known material with these properties is a thermal setting gel using block copolymer polyols, available commercially as Pluronic® polyols (BASF, Ludwigshafen, Germany), which is described in U.S. Patent No. 4,188,373. Adjusting the concentration of the polymer gives the desired liquid-gel transition. However, concentrations of the polyol polymer of at least 18-20 % by weight are needed to produce a composition which exhibits such a transition at commercially or physiologically useful temperatures. Also, solutions containing 18-20 % by weight of responsive polymer are typically very viscous even in the "liquid" phase, so that these solutions can not function under conditions where low viscosity, free-flowing is required prior to transition. In addition, these polymer concentrations are so high that the material itself may cause unfavorable interactions during use.

Another known system which is liquid at room temperature, but forms a semi-solid when warmed to about body temperature is formed from tetrafunctional block polymers of polyoxyethylene and polyoxypropylene condensed with ethylenediamine, commercially available as Tetronic® polyols. These compositions are formed from approximately 10% to 50% by weight of the polyol in an aqueous medium. See, U.S. Patent No. 5,252,318.

Joshi *et al.* in U.S. Patent No. 5,252,318 reports reversible gelling compositions which are made up of a physical blend of a pH-sensitive gelling polymer (such as a cross-linked poly(acrylic acid)) and a temperature-sensitive gelling polymer (such as methyl cellulose or block copolymers of poly(ethylene glycol) and poly(propylene glycol)). In compositions including methylcellulose, 5- to 8-fold increases in viscosity are observed upon a simultaneous change in temperature and pH for very low methylcellulose levels (1-4% by weight). See, Figs. 1 and 2 of Joshi *et al.* In compositions including Pluronic® and Tetronic® polyols, commercially available forms of poly(ethylene glycol)/poly(propylene glycol) block copolymers, significant increases in viscosity (5- to 8-fold) upon a simultaneous change in temperature and pH

are observed only at much higher polymer levels. See, Figs. 3-6 of Joshi *et al.*

⑥ Hoffman *et al.* in WO 95/24430 disclose block and graft copolymers comprising a pH-sensitive polymer component and a temperature-sensitive polymer component. The block and graft copolymers are well-ordered and contain regularly repeating units of the pH-sensitive and temperature-sensitive polymer components. The copolymers are described as having a lower critical solution temperature (LCST), at which both solution-to-gel transition and precipitation phase transition occur. Thus, the transition to a gel is accompanied by the clouding and opacification of the solution. Light transmission is reduced, which may be undesirable in many applications, where the aesthetic characteristics of the composition are of some concern.

Thus, the known systems which exhibit reversible gelation are limited in that they require large solids content and/or in that the increase in viscosity less than 10-fold. In addition, some known systems exhibit an increase in viscosity which is accompanied with the undesirable opacification of the composite.

#### Summary of the Invention

It is an object of the present invention to provide a cosmetic composition which includes a component capable of reversible gelation or viscosification.

It is a further object of the invention to provide a cosmetic composition which includes an ingredient capable of gelation or viscosification at very low solids content.

It is another object of the present invention to provide a cosmetic composition which possesses improved flow and gelation characteristics as compared to properties possessed by conventional reversible gelation compositions.

It is a further object of the invention to provide a polymer network composition for use in cosmetic compositions useful as a surfactant or emulsifier in the solubilization of additives and, in particular, hydrophobic additives.

It is a further object of the invention to provide a cosmetic composition which possesses the appropriate thickness, emolliency and cosmetic effect with a minimum of solids content.

It is a further object of the invention to provide a polymer network for use in

cosmetic compositions useful as a suspending agent for otherwise insoluble additives.

It is yet a further object of the present invention to provide a composition capable of solubilizing emulsions at elevated temperatures.

It is yet a further object of the invention to provide new and useful cosmetic compositions incorporating the reversibly gelling polymer network composition of the present invention, which take advantage of its unique advantageous properties.

It is yet another object of the present invention to provide reversibly gelling polymer network compositions which are composed of biocompatible polymers.

These and other objects of the invention are achieved with a cosmetic composition which incorporates a poloxamer:poly(acrylic acid) polymer network as a cosmetically acceptable carrier. The polymer network comprises a poloxamer component randomly bonded to a poly(acrylic acid), or PAA, component in an aqueous-based medium, the polymer network being capable of aggregating in response to an increase in temperature. The reverse thermal viscifying poloxamer:poly(acrylic acid) polymer network includes random covalent bonding between the poly(acrylic acid) component and the poloxamer component of the network. The polymer network may also include some unbound or "free" poloxamer or other additives which contribute to or modify the characteristic properties of the polymer composition.

In addition, the cosmetic composition includes a cosmetic agent selected to provide a preselected cosmetic effect. By "cosmetic agent", as that term is used herein, it is meant that the additive imparts a cosmetic effect. A cosmetic effect is distinguishable from a pharmaceutical effect in that a cosmetic effect relates to the promoting bodily attractiveness or masking the physical manifestations of a disorder or disease. In contrast, a pharmaceutical seeks to treat the source or symptom of a disease or physical disorder. It is noted however, that the same additives may have either a cosmetic or pharmaceutical effect, depending upon the amounts used and the manner of administration.

By "cosmetic" as that term is used herein, it is meant the cosmetic and

personal-care applications intended to promote bodily attractiveness or to cover or mask the physical manifestations of a disorder or disease. Cosmetics include those products subject to regulation under the FDA cosmetic guidelines, as well as sunscreen products, acne products, skin protectant products, anti-dandruff products, and deodorant and antiperspirant products.

By "gelation" or viscosification, as that term is used herein, it is meant a drastic increase in the viscosity of the polymer network solution. Gelation is dependent on the initial viscosity of the solution, but typically a viscosity increase in the range of preferably 2- to 100-fold, and preferably 5- to 50-fold, and more preferably 10- to 20-fold is observed in the polymer network which is used in the preparation of the cosmetic compositions of the invention. Such effects are observed in a simple polymer network solution and the effect may be modified by the presence of other components in the cosmetic composition.

By "reversibly gelling" as that term is used herein, it is meant that the process of gelation takes place upon an *increase* in temperature rather than a decrease in temperature. This is counter-intuitive, since it is generally known that solution viscosity *decreases* with an increase in temperature.

As used herein, "poloxamer" is a triblock copolymer derived from poly(ethylene glycol)-poly(propylene glycol)-poly(ethylene glycol) blocks. The poloxamer is capable of responding to a change in temperature by altering its degree of association and/or agglomeration. The aggregation may be in the form of micelle formation, precipitation, labile crosslinking or other factors. The poloxamer has the general formula of a triad ABA block copolymer,  $(P_1)_a(P_2)_b(P_1)_a$ , where  $P_1$  = poly(ethylene glycol) and  $P_2$  = poly(propylene glycol) blocks, where  $a$  is in the range of 10-50 and where  $b$  is in the range of 50-70.

The poly(acrylic acid) component includes poly(acrylic acid) and its salts. The poly(acrylic acid) supports and interacts with the poloxamer component so that a multi-material, responsive polymer network is formed. The interaction of the poloxamer and poly(acrylic acid) exhibits a synergistic effect, which magnifies the effect of the poloxamer component in viscosifying and/or gelling the solution.

The novel interaction between the constituent polymers components of the polymer network permits formation of gels at very low solids content. Gelation and/or viscosification is observed in aqueous solutions having about 0.01 to 20 wt% of the poloxamer component and about 0.01 to 20 wt% of the poly(acrylic acid) component. A typical reversibly gelling polymer network may be comprised of less than about 4 wt% of total polymer solids (e.g., poloxamer and poly(acrylic acid)) and even less than 1 wt% total polymer solids while still exhibiting reverse thermal viscosification. Of course, the total solids content including additives of a reversibly gelling polymer network composition may be much higher. The viscosity of the gel increases at least ten-fold with an increase in temperature of about 5°C at pH 7 and 1 wt% polymer. Viscosity increases may be even greater over a larger temperature range at pH 7 and 1% polymer network content.

The relative proportion of poloxamer and poly(acrylic acid) may vary dependent upon the desired properties of the polymer composition. In one embodiment, the poloxamer is present in a range of about 1 to 20 wt% and the poly(acrylic acid) is present in a range about of 99 to 80 wt%. In another embodiment, the poloxamer component is present in a range of about 21 to 40 wt% and the poly(acrylic acid) component is present in a range of about 79 to 60 wt%. In another embodiment, the poloxamer component is present in a range of about 41 to 50 wt% and the poly(acrylic acid) component is present in a range of about 59 to 50 wt%. In another embodiment, the poloxamer component is present in a range of about 51 to 60 wt% and the poly(acrylic acid) component is present in a range of about 49 to 40 wt%. In yet another embodiment, the poloxamer component is present in a range of about 61 to 90 wt% and the poly(acrylic acid) component is present in a range of about 39 to 20 wt%. In another embodiment, the poloxamer component is present in a range of about 81 to 99 wt% and the poly(acrylic acid) component is present in a range of about 19 to 1 wt%.

The poloxamer:poly(acrylic acid) polymer network described above is included in a cosmetic composition to improve the flow characteristics, thickness and other properties of the composition. The composition includes additional cosmetic agents.



such as are needed for the cosmetic purpose of the composition. Additives also may be included to modify the polymer network performance, such as to increase or decrease the temperature of the liquid-to-gel transition and/or to increase or decrease the viscosity of the responsive polymer composition.

5        In one aspect of the invention, the poloxamer:poly(acrylic acid) polymer network is incorporated into a cosmetic compositions to impart thickening properties to the cosmetic composition at the use and/or application temperature. Such thickening properties include enhanced overall viscosity, as well as a desirable viscosity response with temperature. The polymer network may be useful as a thickener in pH ranges  
10        where other thickeners are not effective.

      In another aspect of the invention, the poloxamer:poly(acrylic acid) polymer network is incorporated into a cosmetic composition to stabilize and solubilize hydrophobic agents in the cosmetic composition. The polymer network may be included to increase emulsion stability. Many emulsions, i.e., suspension of small  
15        droplets or particles of a first material in a second material, lose viscosity upon heating. As will be demonstrated herein, the poloxamer:poly(acrylic acid) polymer network retains its emulsifying properties even with temperature increase.

      In addition, it may be included in the composition to impart emolliency to the composition. The composition may also act as a film-forming agent after it has been  
20        applied to the skin. This film-forming agent may be used as a barrier to prevent water loss from the skin which contributes to the moisturization of the skin.

      In another aspect of the invention, the poloxamer:poly(acrylic acid) polymer network may be included as an additive in cosmetic applications to prevent viscosity loss at elevated temperatures.

25

#### Brief Description of the Drawing

The invention is described with reference to the Drawing, which is presented for the purpose of illustration and is in no way intended to be limiting, and in which:

      Figure 1 is a graph of viscosity vs. temperature for a 1 wt%, 2 wt% and 3 wt%  
30        responsive polymer network aqueous composition of a poloxamer/poly(acrylic acid)

(1:1) at pH 7.0 measured at a shear rate of  $0.44 \text{ sec}^{-1}$ ;

Figure 2 is a graph of viscosity vs. temperature for a 1 wt% poloxamer: poly(acrylic acid) polymer network composition demonstrating reversibility of the viscosity response;

5     Figure 3 shows the viscosity response of a 2 wt% poloxamer:poly(acrylic acid) polymer composition at various shear rates;

Figure 4 shows a viscosity response curve for a 2 wt% poloxamer: poly(acrylic acid) polymer network composition prepared with nominal mixing and stirring and prepared using high shear homogenization (8000 rpm, 30 min);

10     Figure 5 is a graph of viscosity vs. temperature for a 1 wt% poloxamer: poly(acrylic acid) polymer network composition at various pHs:

Figure 6 is a graph of viscosity vs. temperature for a 1 wt% poloxamer: poly(acrylic acid) polymer network composition with and without addition of 0.25 wt% KCl;

15     Figure 7 is a graph of viscosity vs. temperature for a 1 wt% poloxamer: poly(acrylic acid) polymer network composition with and without addition of 0.5 wt% acetamide MEA;

Figure 8 is a graph of viscosity vs. temperature for a 1 wt% poloxamer: poly(acrylic acid) polymer network composition without and with 5 wt%, 10 wt% and 20 wt% added ethanol, respectively;

Figure 9 is an illustration of a reversibly gelling polymer network used as an emulsifier and stabilizer for a hydrophobic agent;

Figure 10 is a schematic illustration of the poloxamer:poly(acrylic acid) polymer network below and above the transition temperature illustrating the aggregation of the hydrophobic poloxamer regions;

25     Figure 11 is a graph of viscosity vs. pH for a 1 wt% responsive polymer network aqueous composition of a poloxamer/poly(acrylic acid) (1:1) measured at a shear rate of  $0.44 \text{ sec}^{-1}$ ;

Figure 12 is a plot of viscosity vs. temperature for (a) a 1 wt% responsive polymer network aqueous composition of Pluronic® F127 poloxamer/poly(acrylic acid)

(1:1) and (b) a 1 wt% physical blend of Pluronic® F127 poloxamer/poly(acrylic acid) (1:1) at pH 7.0 measured at a shear rate  $0.22 \text{ sec}^{-1}$ ;

Figure 13 is a plot of viscosity vs. temperature for a 1 wt% responsive polymer network aqueous composition of Pluronic® F88 poloxamer/poly(acrylic acid) (1:1) at pH 7.0 measured at a shear rate  $2.64 \text{ sec}^{-1}$ ;

Figure 14 is a graph of the viscosity vs. temperature effect for a responsive polymer network composition of 2 wt% Pluronic® P104 poloxamer/poly(acrylic acid) (1:1) in deionized water at pH 7.0 measured at shear rate of  $22 \text{ sec}^{-1}$ ;

Figure 15 is plot of viscosity vs. temperature for a responsive polymer network composition of 2 wt% Pluronic® F123 poloxamer/poly(acrylic acid) (1:1) at pH 7.0 measured at a shear rate of  $22 \text{ sec}^{-1}$ ;

Figure 16 is a plot of viscosity vs. temperature for 1 wt% made of series of poloxamers and poly(acrylic acid) (1:1) in deionized water at a shear rate of  $132 \text{ sec}^{-1}$ ;

Figure 17 is a plot showing release of hemoglobin from a poloxamer/poly(acrylic acid) polymer network of the invention;

Figure 18 is a plot showing the release of lysozyme from the poloxamer/poly(acrylic acid) polymer complex of the invention;

Figure 19 is a plot showing release of insulin from a poloxamer/poly(acrylic acid) polymer network composition of the invention;

Figure 20 is a plot of viscosity vs. temperature for a poloxamer/poly(acrylic acid) polymer network composition (a) before and (b) after sterilization by autoclave;

Figure 21 is a plot of viscosity vs. temperature for an oil-free moisturizing formulation prepared from (a) a responsive polymer network composition of the invention and (b) a conventional oil-in-water formulation;

Figure 22 is a plot of equilibrium solubility of estradiol (A, B) and progesterone (C, D) in aqueous solutions (pH 7) of Pluronic® F127 (A, C) and responsive polymer network (B, D) vs. temperature;

Figure 23 is a plot of the ratio of equilibrium solubilities of estradiol in responsive polymer network and water vs. polymer concentration in the responsive polymer network solutions;

Figure 24 is a plot of the effect of loading fluorescein on the onset of gelation of responsive polymer network vs. total polymer concentration in responsive polymer network solution (pH 7.0);

Figure 25 is a plot of the percentage of a) estradiol and b) progesterone release  
5 from responsive polymer network vs. time;

Figure 26 is a plot of the rate of progesterone release and macroscopic viscosity vs. polymer concentration;

Figure 27 is a plot of the percentage of progesterone release vs. polymer concentration in responsive polymer network and,

10 Figure 28 is a plot of the relative diffusivity of poly(styrene) latex particles in water and responsive polymer network.

#### Detailed Description of the Invention

The present invention is directed to a cosmetic composition comprising a  
15 cosmetically acceptable carrier comprising a novel poloxamer:poly(acrylic acid) polymer network. The polymer network functions as a temperature sensitive thickening agent, and in addition possesses surfactant and emulsifying capabilities which may be beneficial to the cosmetic composition. The polymer network composition according to the invention includes a poloxamer component randomly  
20 bonded to a poly(acrylic acid) component. The two polymer components may interact with one another on a molecular level. The polymer network contains about 0.01-20 wt% each of poloxamer and poly(acrylic acid). Exemplary polymer network compositions range from about 1:10 to about 10:1 poloxamer:poly(acrylic acid). Polymer network gel compositions which exhibit a reversible gelation at body  
25 temperature (25-40°C) and/or at physiological pH (ca. pH 3.0-9.0) and even in basic environments up to pH 13 (hair care) are particularly preferred for cosmetic applications.

In one embodiment of the invention, a 1:1 poloxamer:poly(acrylic acid) polymer network at appropriate pH exhibits flow properties of a liquid at about room  
30 temperature, yet rapidly thickens into a gel consistency of at least about five times

greater, preferably at least about 10 times greater, and even more preferably at least about 30 times and up to 100 times greater, viscosity upon increase in temperature of about 10 °C and preferably about 5 °C. The reversibly gelling polymer network of the present invention exhibit gelation even at very low polymer concentrations. For example, polymer network compositions at pH 7 comprising about 0.5 wt% poloxamer component and about 0.5 wt% PAA exhibits a significant increase in viscosity from a free-flowing liquid (50 cps) to a gel (6000 cps). The observed gelation takes place at low solids contents, such as less than 20 wt% or preferably less than about 10 wt%, or more preferably less than about 2.5 wt% or most preferably less than about 0.1 wt%. Thus, only a small amount by weight of the polymer network need be incorporated into a cosmetic composition in order to provide the desired thickening or viscosifying effect.

The reverse viscosification effect at low polymer concentrations provides clear, colorless gels which are particularly well-suited to cosmetic applications. For example, very little residue is formed upon dehydration which may be important in some applications, such as in topically applied cosmetics. An additional advantage of the polymer network of the invention is that it remains clear and translucent above and below the critical temperature or pH. These characteristics of the reversibly gelling polymer network make it well suited for use in cosmetic compositions.

The polymer network of the present invention technology may be added to cosmetic formulations to increase the thickness and viscosity of the composition. The poloxamer:poly(acrylic acid) polymer network possesses hydrophobic regions capable of aggregation. Unlike conventional thickeners, the aggregation of the polymer network of the present invention is temperature sensitive. Thus, the inventive polymer network of the present invention may have a transition temperature (i.e. temperature of aggregation) above room temperature so that the cosmetic composition is of low viscosity at or below room temperature and is of high viscosity at or around body temperature (body temperature includes both surface and internal body temperature). Thus, a composition may be prepared at low temperatures while the polymer network is in a low viscosity state. Mixing of ingredients under low viscosity is expected to be

easier, thus simplifying the manufacturing process. Yet, the resultant mixture would be of increased viscosity at use temperatures. As a further advantage, a cosmetic composition comprising poloxamer:poly(acrylic acid) polymer network may be spread thinly to allow for even application, due to its low viscosity at room temperature, but will thicken and "fill" the skin contours upon warming up to body surface temperature.

In another aspect of the invention, the composition may be applied through a nozzle that provides high shear to reduce viscosity, yet the composition regains its viscosity after application to the skin. This contrasts with conventional formulations which permanently lose viscosity after being subjected to high shear.

In another aspect of the invention, the composition may be formulated and applied as a liquid, spray, semi-solid gel, cream, ointment, lotion, stick, roll-on formulation, mousse, pad-applied formulation, and film-forming formulation.

The poloxamer:poly(acrylic acid) polymer network may also be included in a cosmetic composition for use as a stabilizing, solubilizing or emulsifying agent for a hydrophobic component of the cosmetic formulation. The strong hydrophilic regions of the poloxamer resulting from aggregation and micelle formation create hydrophobic domains which may be used to solubilize and control release of hydrophobic agents. Similar micelle-based systems have been shown to protect trapped peptides against enzymatic degradation from surface enzymes.

The reversibly gelling polymer network of the present invention is a unique polymer composition designed to abruptly change its physical characteristics or the characteristics and properties of materials mixed therewith with a change in temperature. Without intending to be bound by any particular mechanism or chemical structure, it is believed that the structure of the polymer network involves a random bonding of the poloxamer onto the backbone of the poly(acrylic acid). A portion of the poloxamer which is present during the polymerization reaction which forms the poly(acrylic acid) is bonded to the backbone of the forming poly(acrylic acid) through hydrogen abstraction and subsequent reaction. See detailed discussion of the mechanism, below. The combination of the poly(acrylic acid) and randomly bonded poloxamer gives the composition its unique properties. Any free poloxamer remaining

after polymerization of PAA remains associated with the random co-polymer, resulting in a miscible composition. Free poloxamer may also be present in the polymer network composition; however, its presence is not required in order to observe reverse thermal viscosification.

5        ( The poly(acrylic acid) may be linear, branched and/or crosslinked. Poly(acrylic acid) is capable of ionization with a change in pH of the solution. By ionization, as that term is used with respect to poly(acrylic acid), it is meant the formation of the conjugate base of the acrylic acid, namely acrylate. As used herein, poly(acrylic acid) includes both ionized and non-ionized versions of the polymer. Changes in ionic  
10        strength may be accomplished by a change in pH or by a change in salt concentration. The viscosifying effect of the polymer network is partly a function of the ionization of the poly(acrylic acid); however, reverse thermal gelling may occur without ionization. Changes to the ionic state of the polymer causes the polymer to experience attractive (collapsing) or repulsive (expanding) forces. Where there is no need or desire for the  
15        composition to be applied in a high viscosity state, it may be possible to prepare the composition as non-ionized poly(acrylic acid). The body's natural buffering ability will adjust the pH of the applied composition to ionize the poly(acrylic acid) and thereby develop its characteristic viscosity.

20        The poloxamer possesses regions of hydrophobic character, e.g., poly(propylene glycol) blocks, and hydrophilic character, e.g., poly(ethylene glycol) blocks. The poloxamer may be linear or branched. Suitable poloxamers include triad block copolymers of poly(ethylene glycol) and poly(propylene glycol) having the general formula  $(P_1)_a(P_2)_b(P_1)_a$ , where  $P_1$  = poly(ethylene glycol) and  $P_2$  = poly(propylene glycol) blocks, where  $a$  is in the range of 10-50 and where  $b$  is in the range of 50-70.  
25        where poly(propylene glycol) represents the hydrophobic portion of the polymer and poly(ethylene glycol) represents the hydrophilic portion of the polymer. Pluronic® polymers (BASF) are commercially available for  $a$  in the range of 16 to 48 and  $b$  ranging from 54-62. One or more poloxamers may be used in the reversibly gelling polymer network composition of the present invention.

30        The reversibly gelling responsive polymer networks compositions of the present

invention are highly stable and do not exhibit any phase separation upon standing or upon repeated cycling between a liquid and a gel state. Samples have stood at room temperature for more than three months without any noticeable decomposition, clouding, phase separation or degradation of gelation properties. This is in direct contrast to polymer blends and aqueous mixed polymer solutions, where phase stability and phase separation is a problem, particularly where the constituent polymers are immiscible in one another.

An example of the dramatic increase in viscosity and of the gelation of the reversibly gelling polymer network compositions of the invention is shown in Figure 1. Figure 1 is a graph of viscosity vs. temperature for 1 wt%, 2 wt% and 3 wt% polymer network compositions comprising 1:1 poloxamer:poly(acrylic acid), hydrated and neutralized. The viscosity measurements were taken on a Brookfield viscometer at a shear rate of  $0.44 \text{ sec}^{-1}$  at pH 7.0. All solutions had an initial viscosity of about 1080 cP and exhibited a dramatic increase in viscosity to gel point at about  $35^{\circ}\text{C}$ . This is not typical of all polymer network compositions since polymerization condition will affect initial viscosity. Final viscosities were approximately 33,000 cP, 100,000 cP and 155,000 cP for the 1 wt%, 2 wt% and 3 wt% compositions, respectively. This represents viscosity increases of about 30-, 90- and 140-fold, respectively. This effect is entirely reversible. Upon cooling, the composition regains its initial viscosity. This is demonstrated in Figure 2, where a 1 wt% poloxamer:poly(acrylic acid) composition is warmed through the transition temperature up to  $35^{\circ}\text{C}$  (simple curve), cooled to room temperature ( $24^{\circ}\text{C}$ , ticked curve) and then warmed again to up above the transition temperature (open box curve). The viscosity response was virtually identical in all three instances.

As would be expected with a non-Newtonian system, the solution viscosity differs with different shear rates. Figure 3 shows the viscosity response of a 2 wt% poloxamer:poly(acrylic acid) polymer composition at various shear rates. The viscosity response is consistent between  $24^{\circ}\text{C}$  and  $34^{\circ}\text{C}$ ; however, the final viscosity is reduced with increasing shear rate.

However, unlike many prior art hydrogels, e.g., carbomers, the



poloxamer:poly(acrylic acid) polymer network composition does not permanently lose viscosity after being subjected to high shear conditions. The poloxamer:poly(acrylic acid) polymer network composition remains unaffected by such shear conditions as homogenization. Figure 4 compares the viscosity response curve of a 2 wt% poloxamer:poly(acrylic acid) polymer composition prepared with nominal mixing (simple line) and stirring with that of a polymer composition of similar composition prepared using high shear homogenization designated by a ticked line (8000 rpm, 30 min). No significant decrease in viscosity is observed.

A number of factors influence the viscosity and transition temperature of the composition. The more important factors include polymer concentration, pH and presence and nature of additives.

The effect of pH on the viscosity of reversibly gelling polymer networks is shown in Figure 5. Increasing pH from the starting pH has a lesser effect on the viscosity than decreasing the pH. This may relate to the extent of ionization of the poly(acrylic acid) component of the polymer network as discussed above. This may be clearly seen in Figure 5 when comparing the viscosity response of a 1 wt% poloxamer:poly(acrylic acid) polymer composition at pH 5 and pH 11. Satisfactory viscosities can be obtained at high pHs indicating the potential value of the reversibly gelling polymer network in products such as depilatories, hair straighteners and hair relaxers.

The responsive polymer network may also include additives for influencing the performance of the polymer composition, such as the transition temperature and the viscosity of the polymer composition above the transition temperature. The following list is not intended to be exhaustive but rather illustrative of the broad variety of additives which can be used.

These materials include solvents (e.g., 2-propanol, ethanol, acetone, 1,2-pyrrolidinone, N-methylpyrrolidinone), salts (e.g., calcium chloride, sodium chloride, potassium chloride, sodium or potassium phosphates, borate buffers, sodium citrate), preservatives (benzalkonium chloride, phenoxyethanol, sodium hydroxymethylglycinate, ethylparaben, benzoyl alcohol, methylparaben, propylparaben,

butylparaben, Germaben II), humectant/moisturizers (acetamide MEA, lactamide MEA, hydrolyzed collagen, mannitol, panthenol, glycerin), lubricants (hyaluronic acid, mineral oil, PEG-60-lanolin, PPG-12-PEG-50-lanolin, PPG-2 myristyl ether propionate) and surfactants.

5        Surfactants may be divided into three classes: cationic, anionic, and nonionics. An example of a cationic surfactant used is ricinoleamidopropyl ethyldimonium ethosulfate (Lipoquat R). Anionic surfactants include sodium dodecyl sulfate and ether sulfates such as Rhodapex CO-436. Nonionic surfactants include Surfynol CT-111, TG, polyoxyethylene sorbitan fatty acid esters such as Tween 65 and 80, sorbitan fatty  
10       acid esters such as Span 65, alkylphenol ethoxylates such as Igepal CO-210 and 430, dimethicone copolyols such as Dow Corning 190, 193, and Silwet L7001.

         The addition of polymers has been studied including xanthan gum, celluloses such as hydroxyethylcellulose (HEC), carbomethoxycellulose (CMC), lauryldimonium hydroxypropyl oxyethyl cellulose (Crodacel QL), hydroxypropylcellulose (HPC),  
15       hydroxypropylmethylcellulose (HPMC), poly(acrylic acid), cyclodextrins, methyl acrylamido propyl triammonium chloride (MAPTAC), polyethylene oxide, polyvinylpyrrolidone, polyvinyl alcohol, and propylene oxide/ethylene oxide random copolymers. Poloxamers may also be used as additives. Examples include both the Pluronic® polyols having an  $(P_1)_x(P_2)_y(P_3)_z$  structure such as Pluronic® F38, L44, P65,  
20       F68, F88, L92, P103, P104, P105, F108, L122 and F127, as well as the reverse Pluronic® R series  $(P_2)_x(P_1)_y(P_3)_z$  structure such as Pluronic® 17R2 and 25R8. Other miscellaneous materials include propylene glycol, urea, triethanolamine, alkylphenol ethoxylates (Iconol series), and linear alcohol alkoxylates (Plurafac series).

         Additives affect the viscosity of the compositions differently depending upon  
25       the nature of the additive and its concentration. Some additives will affect the initial or final viscosity, whereas others will affect the temperature range of the viscosity response, or both.

         Potassium chloride and acetamide MEA are two examples of additives which decrease the final viscosity of the composition (see, Example 30). KCl (0.25%) added  
30       to a 1 wt% reversibly gelling polymer composition reduces the viscosity by about 3000

cps. See, Figure 6. The humectant, acetamide MEA, lowers the viscosity of a 1 wt% solution by approximately 1,500 cps (see, Figure 7).

Glycerin, ethanol and dimethicone copolymer have been shown to affect the temperature range over which the viscosity response occurs. Glycerin shifts the transition temperature to a slightly lower range from an initial 24-34 °C to about 24-30 °C, but does not affect the final viscosity (see, Example 44). The effect of ethanol on the viscosity is different at different concentration levels. At 5 wt% and 10 wt% added ethanol, the transition temperature is shifted to lower ranges, e.g., 24-29 °C and 20-29 °C, respectively. At 20 wt% added ethanol, the composition not only exhibits a lowering of the transition temperature, but also a marked increase in initial and final viscosity. See, Figure 8. Dimethicone copolymer (1 wt%) also changed the transition temperature, but in this instance the transition temperature range was raised to 28-41 °C. Thus, proper selection of additives permits the formulator to adjust the transition temperature to various ranges.

Those skilled in the art will appreciate that the polymer network compositions of the present invention may be utilized for a wide variety of cosmetic and personal care applications. To prepare a cosmetic composition, an effective amount of cosmetically active agent(s) which imparts the desirable cosmetic effect is incorporated into the reversibly gelling polymer network composition of the present invention. Preferably the selected agent is water soluble, which will readily lend itself to a homogeneous dispersion through out the reversibly gelling polymer network composition; however, the polymer network has been demonstrated to significantly solubilize or suspend hydrophilic agents in order to improve formulation homogeneity (see, Example 36). It is also preferred that the agent(s) is nonreactive with the polymer network composition. For materials which are not water soluble, it is also within the scope of the invention to disperse or suspend powders or oil (lipophilic materials) throughout the polymer network composition. It will also be appreciated that some applications may require a sterile environment. It is contemplated as within the scope of the invention that the reversibly gelling polymer network compositions of the present invention may be prepared under sterile conditions. An additional feature

cps: See, Figure 6. The humectant, acetamide MEA, lowers the viscosity of a 1 wt% solution by approximately 1,500 cps (see, Figure 7).

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of the reversibly gelling polymer composition is that is prepared from constituent polymers that have known accepted toxicological profiles.

The poloxamer:poly(acrylic acid) polymer network has been evaluated under Good Laboratory Practice (GLP) standard protocols known in the art for toxicity in animal models and found to exhibit no toxic effects. The results of the toxicity study are summarized in the following Table 1. The non-toxicity of the polymer network makes it an ideal candidate for use in cosmetic compositions.

**Table 1. Toxicity data for 6% poloxamer:poly(acrylic acid) solution at pH 7.**

Reaction testes	mode of testing	results
Skin sensitization	guinea pig - topical	not a sensitizer
eye irritation	rabbit eye instillation	negative
primary dermal irritation	rabbit - topical	very slight edema (1 on a scale of 1-8)
acute dermal toxicity	rat - single dose (2g/kg)	no toxicity
acute oral toxicity	rat - single dose (5g/kg)	no toxicity
AMES test		negative

Exemplary cosmetic and personal care applications, for which the reversibly gelling polymer network composition may be used include, but are not limited to, baby products, such as baby shampoos, lotions, powders and creams; bath preparations, such as bath oils, tablet and salts, bubble baths, bath fragrances and bath capsules; eye makeup preparations, such as eyebrow pencil, eyeliner, eye shadow, eye lotion, eye makeup remover and mascara; fragrance preparations, such as colognes and toilet waters, powders and sachets; noncoloring hair preparations, such as hair conditioner, hair spray, hair straighteners, permanent waves, rinses shampoos, tonics, dressings and other grooming aids; color cosmetics; hair coloring preparations such as hair dye, hair tints, hair shampoos, hair color sprays, hair lighteners and hair bleaches; makeup preparations such as face powders, foundations, leg and body paints, lipstick, makeup bases, rouges and makeup fixatives; manicuring preparations such as basecoats and

undercoats, cuticle softeners, nail creams and lotions, nail extenders, nail polish and enamel, and nail polish and enamel remover; oral hygiene products such as dentrifices and mouthwashes; personal cleanliness, such as bath soaps and detergents, deodorants, douches and feminine hygiene product; shaving preparations such as aftershave lotion, beard softeners, men's talcum, shaving cream, shaving soap and preshave lotions; skin care preparations such as cleansing preparations, skin antiseptics, depilatories, face and neck cleansers, body and hand cleansers, foot powders and sprays, moisturizers, night preparations, paste masks, and skin fresheners; and suntan preparations such as suntan creams, gels and lotions, indoor tanning preparations.

Preparation of the above-named cosmetic compositions and others may be accomplished with reference to any of the cosmetic formulation guidebooks and industry journals which are available in the cosmetic industry. These references supply standard formulations which may be modified by the addition or substitution of the reversible viscosifying polymer network of the present invention into the formulation. Suitable guidebooks include Cosmetics and Toiletries Magazine, Vol. 111 (March, 1996); Formularv: Ideas for Personal Care; Croda, Inc. Parsippany, NJ (1993); and Cosmeticon: Cosmetic Formularv, BASF, which are hereby incorporated in their entirety by reference.

The cosmetic composition may be in any form. Suitable forms include but are not limited to lotions, creams, sticks, roll-ons formulations, mousses, aerosol sprays, pad-applied formulations, and film-forming formulations.

As those skilled in the art will appreciate, the foregoing list is exemplary only. Because the reversibly gelling polymer network composition of the present invention is suited for application under a variety of physiological conditions, a wide variety of cosmetically active agents may be incorporated into and administered from the polymer network composition. In addition to the poloxamer:poly(acrylic acid) polymer network, additional cosmetically acceptable carriers may be included in the composition, such as by way of example only, emollients, surfactants, humectants, powders and other solvents. By way of example only, the cosmetic composition also may include additional components, which serve to provide additional aspects of the

cosmetic affect or to improve the stability and/or administration of the cosmetic. Such additional components include, but are not limited to, preservatives, abrasives, acidulents, antiacne agents, anti-aging agents, antibacterials, anticaking, anticaries agents, anticellulites, antidandruff, antifungal, anti-inflammatories, anti-irritants, antimicrobials, antioxidants, astringents, antiperspirants, antiseptics, antistatic agents, astringents, binders, buffers, additional carriers, chelators, cell stimulants, cleansing agents, conditioners, deodorants, depilatories, detergents, dispersants, emollients, emulsifiers, enzymes, essential oils, exfoliants, fibers, film forming agents, fixatives, foaming agents, foam stabilizers, foam boosters, fungicides, gellants, glosser, hair conditioner, hair set resins, hair sheen agents, hair waving agents, humectants, lubricants, moisture barrier agents, moisturizers, ointment bases, opacifier, plasticizer, polish, polymers, powders, propellant, protein, refatting agents, sequestrant, silicones, skin calming agents, skin cleansers, skin conditioners, skin healing, skin lightening agents, skin protectants, skin smoothing agents, skin softening agents, skin soothing agents, stabilizers, sunscreen agents, surfactants, suspending agents, tanning accelerators, thickeners, vitamins, waxes, wetting agents, liquefiers, colors, flavors and/or fragrances. Suitable materials which serve the additive functions listed here are well known in the cosmetic industry. A listing of the additive function and materials suitable for incorporation into the cosmetic composition may be found in Appendix A, which is appended hereto at the end of the specification. Further information may be obtained by reference to The Cosmetic Bench Handbook, Cosmetics & Toiletries; C.C. Urbano, editor, Allured Publ. Corp., 1996, which is hereby incorporated in its entirety by reference.

A brief description of some preferred additives and cosmetically active agents follows. The compositions of the invention include a safe and effective amount of a cosmetically active agent. "Safe and effective", as it is used herein, means an amount high enough to significantly positively modify the condition to be treated or the cosmetic effect to be obtained, but low enough to avoid serious side effects.

Preservatives can be desirably incorporated into the cosmetic compositions of the invention to protect against the growth of potentially harmful microorganisms.

Suitable preservatives include, but are not limited to, alkyl esters of para-hydroxybenzoic acid, hydantoin derivatives, parabens, propionate salts, triclosan tricarbonyl, tea tree oil, alcohols, farnesol, farnesol acetate, hexachlorophene and quaternary ammonium salts, such as benzalkonium, and a variety of zinc and aluminum salts. Cosmetic chemists are familiar with appropriate preservatives and may select that which provides the required product stability. Preservatives are preferably employed in amounts ranging from about 0.0001% to 2% by weight of the composition.

Emollients can be desirably incorporated into the cosmetic compositions of the invention to provide lubricity to the formulation. Suitable emollients may be in the form of volatile and nonvolatile silicone oil, highly branched hydrocarbons and synthetic esters. Amounts of emollients may be in the range of about 0.1-30 wt%, and preferably about 1-20 wt%. By way of example only, suitable silicones include cyclic or linear polydimethylsiloxanes, polyalkylsiloxanes, polyalkylarylsiloxanes and polyether siloxanes. By way of example only, suitable ester emollients include alkenyl esters of fatty acids, polyhydric alcohols, such as ethylene glycol mono and di-fatty acid esters, polyethylene glycol and the like, ether-esters, such as fatty acid esters of ethoxylated fatty alcohols, wax esters, such as beeswax, spermaceti, myristyl myristate and stearyl stearate, and sterol esters, such as cholesterol fatty acids.

A variety of oily emollients may be employed in the compositions of this invention. These emollients may be selected from one or more of the following classes: 1. Triglyceride esters such as vegetable and animal fats and oils. Examples include castor oil, cocoa butter, safflower oil, cottonseed oil, corn oil, olive oil, cod liver oil, almond oil, avocado oil, palm oil, sesame oil, squalene, Kikui oil and soybean oil; 2. Acetoglyceride esters, such as acetylated monoglycerides; 3. Ethoxylated glycerides, such as ethoxylated glyceryl monostearate; 4. Alkyl esters of fatty acids having 10 to 20 carbon atoms, such as, methyl, isopropyl, and butyl esters of fatty acids, and including hexyl laurate, isohexyl laurate, isohexyl palmitate, isopropyl palmitate, decyl oleate, isodecyl oleate, hexadecyl stearate decyl stearate, isopropyl isostearate, diisopropyl adipate, diisohexyl adipate, dihexyldecyl adipate,



diisopropyl sebacate, lauryl lactate, myristyl lactate, and cetyl lactate; 5. alkenyl esters of fatty acids having 10 to 20 carbon atoms, such as oleyl myristate, oleyl stearate, and oleyl oleate and the like; 6. fatty acids having 10 to 20 carbon atoms, such as pelargonic, lauric, myristic, palmitic, stearic, isostearic, hydroxystearic, oleic, linoleic, ricinoleic, arachidic, behenic, and erucic acids and the like; 7. fatty alcohols having 10 to 20 carbon atoms, such as, lauryl, myristyl, cetyl, hexadecyl, stearyl, isostearyl, hydroxystearyl, oleyl, ricinoleyl, behenyl, erucyl, and 2-octyl dodecanyl alcohols are examples of satisfactory fatty alcohols and the like; 8. fatty alcohol ethers, such as ethoxylated fatty alcohols of 10 to 20 carbon atoms including the lauryl, cetyl, stearyl, isostearyl, oleyl, and cholesterol alcohols, having attached thereto from 1 to 50 ethylene oxide groups or 1 to 50 propylene oxide groups; 9. ether-esters such as fatty acid esters of ethoxylated fatty alcohols; 10. Lanolin and derivatives, such as lanolin, lanolin oil, lanolin wax, lanolin alcohols, lanolin fatty acids, isopropyl lanolate, ethoxylated lanolin, ethoxylated lanolin alcohols, ethoxylated cholesterol, propoxylated lanolin alcohols, acetylated lanolin alcohols, lanolin alcohols linoleate, lanolin alcohols ricinoleate, acetate of lanolin alcohols ricinoleate, acetate of ethoxylated alcohols-esters, hydrogenolysis of lanolin, ethoxylated hydrogenated lanolin, ethoxylated sorbitol lanolin, and liquid and semisolid lanolin absorption bases and the like; 11. polyhydric alcohol esters, such as, ethylene glycol mono and di-fatty acid esters, diethylene glycol mono- and di-fatty acid esters, polyethylene glycol (200-6000) mono- and di-fatty acid esters, propylene glycol mono- and di-fatty acid esters, polypropylene glycol 2000 monooleate, polypropylene glycol 2000 monostearate, ethoxylated propylene glycol monostearate, glyceryl mono- and di-fatty acid esters, polyglycerol polyfatty esters, ethoxylated glyceryl monostearate, 1,2-butylene glycol monostearate, 1,2-butylene glycol distearate, polyoxyethylene polyol fatty acid ester, sorbitan fatty acid esters, and polyoxyethylene sorbitan fatty acid esters are satisfactory polyhydric alcohol esters; 12. wax esters such as beeswax, spermaceti, myristyl myristate, stearyl stearate; 13. beeswax derivatives, e.g. polyoxyethylene sorbitol beeswax; 14. vegetable waxes including carnauba and candelilla waxes; 15. phospholipids such as lecithin and derivatives; 16. sterol including cholesterol and cholesterol fatty acid

esters; 17. amides such as fatty acid amides, ethoxylated fatty acid amides, solid fatty acid alkanolamides.

Humectants may be added to the composition to increase the effectiveness of the emollient, to reduce scaling, to stimulate removal of built-up scale and improve skin feel. By way of example only, suitable humectants include polyhydric alcohols, 5 such as glycerol, polyalkylene glycols, alkylene polyols their derivatives, propylene glycol, dipropylene glycol, polypropylene glycol, polyethylene glycol, sorbitol, hydroxypropyl sorbitol, hexylene glycol, 1,3-butyleneglycol, 1,2,6-hexanetriol, ethoxylated glycerol, propoxylated glycerol and the like. The amount of humectant 10 may be in the range of about 0.5-30 wt% and preferably between 1-15 wt%.

In topical skin care applications, a variety of active substances may be advantageously employed. By way of example only suitable active agents which may be incorporated into the cosmetic composition include anti-aging active substances, anti-wrinkle active substances, hydrating or moisturizing or slimming active 15 substances, depigmenting active substances, substances active against free radicals, anti-irritation active substances, sun protective active substances, anti-acne active substances, firming-up active substances, exfoliating active substances, emollient active substances, and active substances for the treating of skin disorders such as dermatitis and the like.

20 By way of example only, in the case of hydration, one or more moisturizers may be used, such as glycerin or urea, in combination with one or more precursor agents for the biosynthesis of structural proteins, such as hydroxyproline, collagen peptides and the like.

By the way of example only, in case of slimming, at least one ketolytic agent 25 or an alpha-hydroxyacid such as salicylic acid or 5-n-octanoic salicylic acid may be used in combination with at least one liporegulating agent such as caffeine.

By way of example only, in the case of depigmentation, at least one keratolytic agent is used in combination with a depigmenting agent such as hydroquinone, tyrosinase inhibitor (koscic acid), ascorbic acid, kojic acid and sodium metabisulfite an 30 the like.

By way of example only, in the case of protection against free radical agents, vitamin E (against  $\text{COO}^\cdot$  radicals), superoxide dismutase (against  $\text{O}_2^\cdot$  free radicals) and sugar and caffeine (against  $\text{OH}^\cdot$  free radicals).

By way of example only, in the case of anti-aging, moisturizers, sunscreens, 5 alpha-hydroxyacids, salicylic acid or surface restructuring agents may be used in combination with enzymes for the repair of DNA, vascular protective agents or phospholipids rich in oligoelements and polyunsaturated fatty acids.

By way of example only, in the case of anti-acne agents, keratolytics, such as salicylic acid, sulfur, lactic acid, glycolic, pyruvic acid, urea, resorcinol and N- 10 acetylcysteine, and retinoids, such as retinoic acid and its derivatives may be used.

By way of example only, in the case of anti-inflammation, non-steroidal anti-inflammatory agents (NSAIDS) may be used, such as propionic acid derivatives, acetic acid, fenamic acid derivatives, biphenylcarboxylic acid derivatives, oxicams, including but not limited to aspirin, acetaminophen, ibuprofen, naproxen, benoxaprofen, 15 flurbiprofen, fenbufen, ketoprofen, indoprofen, piroprofen, carprofen, and bucloxic acid and the like.

By way of example only, in the case of antibiotics and antimicrobials may be included in the composition of the invention. Antimicrobial drugs preferred for inclusion in compositions of the present invention include salts of  $\beta$ -lactam drugs, 20 quinolone drugs, ciprofloxacin, norfloxacin, tetracycline, erythromycin, amikacin, triclosan, doxycycline, capreomycin, chlorhexidine, chlortetracycline, oxytetracycline, clindamycin, ethambutol, hexamidine isethionate, metronidazole, pentamidine, gentamicin, kanamycin, lineomycin, methacycline, methenamine, minocycline, neomycin, netilmicin, paromomycin, streptomycin, tobramycin, miconazole and 25 amanfadin and the like.

By way of example only, in the case of sunscreen protection, suitable agents include 2-ethylhexyl p-methoxycinnamate, 2-ethylhexyl N,N-dimethyl-p-aminobenzoate, p-aminobenzoic acid, 2-phenyl p-methoxycinnamate, 2-ethylhexyl octocrylene, oxybenzone, homomenthyl salicylate, octyl salicylate, 4,4'-methoxy-t- 30 butyldibenzoylmethane, 4-isopropyl dibenzoylmethane, 3-benzylidene camphor, 3-(4-

methylenbenzylidene) camphor, titanium dioxide, zinc oxide, silica, iron oxide, and mixtures thereof and the like. The sunscreens disclosed therein have, in a single molecule, two distinct chromophore moieties which exhibit different ultra-violet radiation absorption spectra. One of the chromophore moieties absorbs predominantly in the UVB radiation range and the other absorbs strongly in the UVA radiation range. These sunscreens provide higher efficacy, broader UV absorption, lower skin penetration and longer lasting efficacy relative to conventional sunscreens. Generally, the sunscreens can comprise from about 0.5% to about 20% of the compositions useful herein. Exact amounts will vary depending upon the sunscreen chosen and the desired Sun Protection Factor (SPF). SPF is a commonly used measure of photoprotection of a sunscreen against erythema.

By way of example only, in the case of sunless tanning agents include dihydroxyacetone, glyceraldehyde, indoles and their derivatives, and the like.

The composition may include cleansing surfactants. Cleansing surfactants are cationic, anionic, amphoteric or non-ionic surfactants which are water-soluble and produce a consumer-acceptable amount of foam. Nonionic surfactants are well-known materials and have been used in cleansing compositions. Therefore, suitable nonionic surfactants include, but are not limited to, compounds in the classes known as alkanolamides, block copolymers of ethylene and propylene, ethoxylated alcohols, ethoxylated alkylphenols, alkyl polyglycosides and mixtures thereof. In particular, the nonionic surfactant can be an ethoxylated alkylphenol, i.e., a condensation product of an alkylphenol having an alkyl group containing from about 6 to about 12 carbon atoms in either a straight chain or branched chain configuration with ethylene oxide, the ethylene oxide being present in an amount equal to at least about 8 moles ethylene oxide per mole of alkylphenol. Examples of compounds of this type include nonylphenol condensed with about 9.5 moles of ethylene oxide per mole of phenol; dodecylphenol condensed with about 12 moles of ethylene oxide per mole of phenol; dinonylphenol condensed with about 15 moles of ethylene oxide per mole of phenol; octylphenol condensed with about ten moles of ethylene oxide per mole of phenol; and diisooctyl phenol condensed with about 15 moles of ethylene oxide per mole of

phenol.

A wide variety of acids, bases, buffers, and sequestrants can be utilized to adjust and/or maintain the pH and ionic strength of the compositions useful in the instant invention. Materials useful for adjusting and/or maintaining the pH and/or the ionic strength include sodium carbonate, sodium hydroxide, hydrochloric acid, phosphoric acid, sulfuric acid, acetic acid, sodium acetate, sodium hydrogen phosphate, sodium dihydrogen phosphate, citric acid, sodium citrate, sodium bicarbonate, triethanolamine, EDTA, disodium EDTA, tetrasodium EDTA, and the like.

The polymer network may be useful as a solubilization agent in cosmetic and personal care applications. A self-assembling system comprising the reversibly gelling polymer network exhibits thermogelation, pH sensitivity, and the ability to solubilize hydrophobic agents in aqueous media. When poloxamer is copolymerized with poly(acrylic acid) (PAA) according to the invention, the resulting copolymer network is bioadhesive and can be applied in a number of therapies. The materials described in this invention combine "reverse" thermoviscosification mucoadhesion, solubilization of hydrophobic and difficult to manage moieties, easy formulation, and protection of agents from degradation to provide a superior medium for cosmetic and personal care products.

The reversible viscosification of the polymer network at elevated temperatures makes the materials ideal for use as thickening agents in cosmetic and personal care products at any temperature above the transition. Another use of the "thickening" of solutions containing the polymer network as a thickener supplement in emulsions. Currently emulsifiers are often negatively effected by increased temperatures. An additive with reverse thermal viscosification properties, however, would react in exactly the opposite way, increasing its ability to emulsify as it gained three-dimensional structure upon heating above its transition temperature.

In the applications where the reversibly gelling polymer composition can act as a surfactant, the polymer network will have the ability to act as a primary emulsifier without any (or with very little) addition of traditional surfactant. The responsive polymer network will also act as a stabilizer for oil-soluble ingredients that would

conventionally need to be solubilized by oils in formulation. The hydrophobic portion of the polymer network (PPO) forms domains which act as reservoirs for an oil-soluble or hydrophobic additive, such as an oil droplet, as is illustrated in Figure 9. These two features of the material of the invention would enable it to be used as a base in a cosmetic formulation that would be non-greasy due to lack of oils, such as petrolatum and mineral oil. The increase in viscosity above the transition temperature adds structure and yield value to the water phase and results in a highly stable emulsion.

Thus, poloxamer:poly(acrylic acid) polymer network compositions are valuable materials in the formulation of cosmetic and personal care products. In particular, they may be useful as rheology modifiers, provide a cushioning effect on the skin, offer barrier properties and controlled release of actives. In addition, the polymer composition may serve as a surfactant and is compatible with most ingredients used in the cosmetic industry.

The above properties of the poloxamer:poly(acrylic acid) polymer network provides a cosmetic composition that spreads evenly and smoothly and which leaves a lubricious feel to the skin. A sensory evaluation was conducted with seven random volunteers in order to determine the sensory effect of a cream formulation on the skin. An oil-free cosmetic formulation was prepared substantially as set forth in Example 33(b) and was compared to Nivea Oil Free, a product of Beiersdorf of Germany. Volunteers placed unmarked samples on the skin and evaluated the formulation based upon its feel and texture. The samples were rated on a scale of 1 (bad) to 5 (good). The oil-free cosmetic formulation of the present invention scored equally to the Nivea Oil Free moisturizing product. Both samples scored a 3.5 on the rating scale.

The observed thermal behavior of the reversibly gelling polymer network suggests that the increase in viscosity is due to aggregation of the hydrophobic portion of the poloxamer at the transition temperature which, because of bonding with the poly(acrylic acid) component, serve as temporary cross-links which physically bridge adjacent chains of poly(acrylic acid) to provide a viscous gel-like extended polymer structure. The aggregation process may be understood as occurring as shown in Figure

10, in which a backbone 20 represent poly(acrylic acid), a thin band 24 represents the hydrophobic poly(propylene) glycol region of the poloxamer and a thick band 26 represents the hydrophilic poly(ethylene glycol) region of the poloxamer. Below the transition temperature, the polymer network is randomly arranged, as is shown in Figure 10(a). At or above the transition temperature, the hydrophobic regions 24 associate to form aggregations or micelles 28, as is shown in Figure 10(b). The association increases the effective molecular weight of the polymer network composition with the corresponding increase in viscosity.

*ynthese*

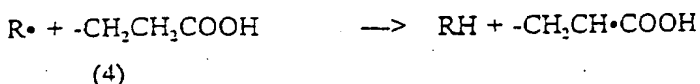
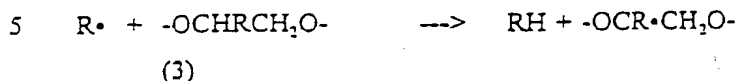
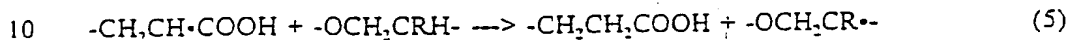
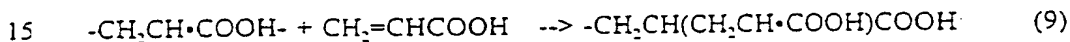
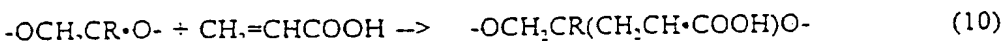
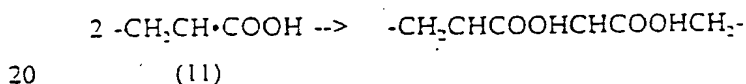
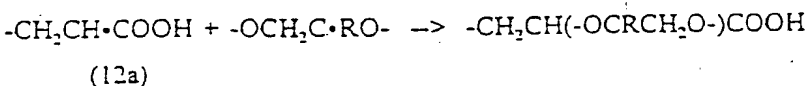
10 A general method of making the poloxamer:PAA polymer network compositions of the present invention comprises solubilization of the poloxamer in acrylic acid monomer, followed by polymerization of the monomer to PAA. Polymerization may be accomplished by addition of a polymerization initiator or by irradiation techniques. The initiator may be a free radical initiator, such as chemical free radical initiators and uv or gamma radiation initiators. Conventional free radical

15 initiators may be used according to the invention, including, but in no way limited to ammonium persulfate, benzoin ethyl ether, benzyl peroxide, 1,2'-azobis(2,4-dimethylpentanitrile) (Vazo 52) and azobisisobutyronitrile (AIBN). Initiation may also be accomplished using cationic or ionic initiators. Many variations of this methods will be apparent to one skilled in the art and are contemplated as within the scope of

20 the invention. For example, the poloxamer component may be dissolved in an acrylic acid/water mixture instead of pure monomer. It may be desirable to remove unreacted monomer and/or free poloxamer from the resultant polymer network. This may be accomplished using conventional techniques, such as, by way of example, dialysis or sohxlet extraction.

25 Without intending to be bound by a particular mechanism or structure, the following scheme represents a possible chemical mechanism for the formation of the system here described. These mechanisms are presented by way of explanation and are no way limiting of the invention. It is contemplated that these or other mechanistic routes may in fact occur in the formation of the polymer network of the

30 present invention.

I. InitiationII. Hydrogen AbstractionIII. Chain TransferIV. PropagationV. Side Chain Branching Off AA BackboneVI. AA Branching off Poloxamer BackboneVII. Homogenous TerminationVIII. Heterogenous Termination with bonding of Pluronic to PAA

The scheme for bonding of poloxamer to acrylic acid may involve initiation (eq 1), hydrogen abstraction from the propylene or ethylene moiety of the poloxamer (eq 3), and attachment to acrylic acid via addition across the unsaturated bond (eq 10). Propagation (eq 8) leads to the final PAA.

Alternatively, the mechanism may proceed by initiation according to eqs. (1) and (2), propagation to form PAA (eq.8), a chain transfer reaction to generate a reactive poloxamer moiety (eq. 5), followed by addition of the reactive poloxamer



moiety to the unsaturated bond of acrylic acid (eq. 10) and subsequent propagation of the PAA chain.

Thus the polymer network may include a plurality of poly(acrylic acid)) units bonded to a single poloxamer unit or, alternatively, a plurality of poloxamer units bound to a single PAA backbone. Combinations of these alternatives are also a possibility.

Reverse phase polymerization may be used to prepare polymer network beads by dispersion of the poloxamer and acrylic acid monomer mixture in a nonpolar solvent such as hexane or heptane. The aggregating polymer/monomer solution is dispersed with agitation in the nonpolar solvent in order to suspend droplets of the solution. Polymerization of the monomer is initiated by conventional means (i.e., addition of a initiator or irradiation) in order to polymerize the monomer and form responsive polymer network beads. See, U.S.S.N. 08/276,532 filed July 18, 1995 and entitled "Useful Responsive Polymer Gel Beads" for further information on the preparation of polymer gel beads, herein incorporated by reference. Such a method may be particularly desirable to provide a heat sink for the heat generated in the exothermic polymerization reaction.

The polymer network complexes and aqueous gelling solutions of the present invention may be understood with reference to the following examples, which are provided for the purposes of illustration and which are in no way limiting of the invention.

Example 1 This example describes the synthesis of a polymer network and an aqueous responsive polymer network solution prepared using a triblock polymer of poly(ethylene glycol) and poly(propylene glycol), Pluronic® F27 polyol, and poly(acrylic acid). This example also characterizes the gelation and the physical properties of the resultant polymer network.

Synthesis. Block copolymer of poly(propylene glycol) (PPG) and poly(ethylene glycol) (PEG) having triad ABA structure  $(PEG)_A(PPG)_B(PEG)_A$  (Pluronic® F127 NF polyol, Poloxamer 407 NF polyol, where "F" means Flakes, "12" means 12X300=3600 - MW of the PPG section of the block copolymer. "7" PEG in

the copolymer is 70 wt%, and nominal molecular weight is 12,600) from BASF (3.0 g) was dissolved in 3.0 g acrylic acid (Aldrich). This represents a substantially 1:1 weight ratio of Pluronic® F127 polyol and poly(acrylic acid). The solution was deaerated by N<sub>2</sub> bubbling for 0.5 h and following addition of 100 ml of freshly prepared saturated solution of ammonium persulfate (Kodak) in deionized water was kept at 70 °C for 16 h resulting in a transparent polymer.

*ret. cell*  
Viscosity measurements. A known amount of the resultant polymer was suspended in 100 ml deionized water into which NaOH was added. Following swelling for 3 days while stirring, the pH of the resulting fine suspension was adjusted to 7. Samples of 15 ml each were taken, and pH in each vial was adjusted to desired value by addition of 1 M HCl or NaOH. Samples were then kept overnight and their viscosities were measured at different temperatures using Brookfield viscometer using either an SC4-18 or an SC4-25 spindle.

A control experiment was done with a physical blend of Pluronic® F127 polyol and poly(acrylic acid) (MW 450,000) available from Aldrich. Pluronic® F127 polyol and poly(acrylic acid) were dissolved together in deionized water at 1 wt% total polymer concentration and the resultant solution was adjusted to pH 7, stirred and kept in refrigerator. The responsiveness of the polymer network composition and the physical blend to temperature and pH is illustrated in Figs. 1, 11 and 12. Figs. 1 and 2 clearly demonstrate that the synthetic route outlined above resulted in a polymer network system that is sensitive to pH and temperature of the environment. Note that the liquid-gel transition is very sharp, occurring over a very small temperature change or pH (see, Figure 11). Figure 12 is a viscosity vs. temperature graph comparing the gelling characteristics of the responsive polymer network composition and the physical blend. The blend prepared by physically mixing of the triblock PEG/PPG/PEG polymer and poly(acrylic acid) did not exhibit viscosifying effect either as a function of temperature or pH.

It was generally observed that 0.5-5 wt% polymer network compositions made of Pluronic® F127 polyol and poly(acrylic acid) viscosify at temperatures of around 30 °C and higher if pH is adjusted to 6 or higher. The gelling effect was observed in

polymer network compositions standing 3 months or longer. Repeated heating and cooling of responsive polymer network compositions did not cause deterioration of the polymer network or the gelling effect. Solutions of either Pluronic® F127 polyol or poly(acrylic acid) (1-5 w% in water, adjusted to pH 6 or higher) or physical blends of the two lacked the reverse thermal gelling effects found for polymer network compositions.

Example 2. This example describes a standard operating procedure for the manufacture of the reversible gelling polymer network.

The procedure is based upon a 50 liter production. A NaOH solution was prepared by dissolving 131.8 g NaOH pellets in 131.8 mL DI water (50% solution). The NaOH was allowed to dissolve completely. The NaOH solution will be used to convert a percentage of the acrylic acid to sodium acrylate in situ. Acrylic acid monomer (4 kg) is charged into a monomer feed tank and agitated at 250 rpm. NaOH is added slowly. The precipitate formed as the acrylic acid is neutralized to sodium acrylate is allowed to dissolve. Pluronic® F127 (3.5 kg) is slowly added to the monomer feed tank. Pluronic® F127 is dissolved under continued agitation. Norpar 12 (a refined C-12 alkane) is added to the reaction vessel (37 L). The mixture is agitated at 100 rpm. Stabilizer solution of Ganex V-126 is prepared in 2L Norpar 12 and added to the reactor under agitation.

A reaction vessel was degassed using a nitrogen sparge introduced from the bottom of reactor and was continued throughout the reaction. Initiator (13.63 g Lauryl peroxide and 4.23 g Vazo 52 in 0.7 kg acrylic acid monomer) is introduced into the monomer solution. The monomer solution was transferred to the reaction vessel. Agitation was increased to 150 rpm. Nitrogen sparging continued for an additional 20 minutes and then heating began. Heating began at a rate of 0.5-1.0 °C/min up to 75 °C. The reaction began to exotherm at about 45-50 °C and is allowed to continue without cooling until a maximum is reached. It is then cooled to 75 °C using forced cooling. The reaction continued for 12 hours and was then cooled to 35 °C. The slurry was transferred into pails and the polymer beads were allowed to settle.

The slurry was filtered through Buchner Funnels with filter paper (11 µm pore

polymer  
reticuli?

size) until the bulk of the Norpar had been removed from the beads. The beads were washed three times with heptane. The filtered beads were transferred to a Pyrex drying tray and spread on the tray in a uniform layer. The beads were dried under vacuum for 4 hours at 40-50 °C. The dried beads were analyzed as follows.

5        Elemental analysis. The elemental analysis was performed by Quantitative Technologies, Inc., Whitehouse, NJ using a Perkin Elmer 2400 CHN Elemental Analyzer. Analysis provided C (52.49%), H (7.50%), N (< 0.05%), the balance assumed to be oxygen (39.96%).

10        Thermal Gravimetric Analysis (TGA). The TGA method was performed by Massachusetts Material Research, Inc., West Boylston, MA using a Dupont TGA model 295. The assay was run using a temperature ramp from 30 to 500 °C/min. The resolution for the system was set to 4 (1.0 °C/min for all slope changes). The data was analyzed using the first derivative of the curve and using maxima and minima to mark transitions. The moisture content was also calculated in this manner. The first  
15        derivative yielded three maxima. The first transition (moisture) was 3.0% by weight. the second transition was 14.0% by weight and the third was 67.02% by weight. Residue (15.98% remained).

20        Molecular weight determination by gel permeation chromatography (GPC). The molecular weight was determined by GPC on a Hewlett Packard 1100 Liquid Chromatography system with a Viscotek T60 Triple Detector system. Three Waters Ultrahydrogel columns, 1000, 500 and 250 Å, were used for the separation. The mobile phase was 0.1M NaNO<sub>3</sub> and 0.01M K<sub>2</sub>HPO<sub>4</sub> salt solution, pH adjusted with phosphoric acid to a pH of 8.0 ± 0.1. The flow rate for the separation was 0.9 mL/min. The column temperature was maintained at 15 °C. The injection volume for  
25        the assay was 50 µL. A PEG molecular weight standard of 23,000 Daltons was used to align the detectors. The result for the assay were:

$M_n$ : 341,700 Daltons

$M_p$ : 1,607,000 Daltons

$M_w$ : 2,996,000 Daltons

30        Free poloxamer determination by GPC. The amount of free (unbound)

poloxamer in the polymer matrix was determined using the above GPC method and comparing the poloxamer peaks to that of a standard poloxamer solution. The typical result is approximately 18-22% free poloxamer by weight.

( The effect of both the bonded and non-bonded poloxamer on the gelation  
5 properties of the responsive polymer network has been determined by extraction of the non-bonded poloxamer from the material. Such extraction studies have established that the graft co-polymer alone exhibits the characteristic reverse thermal gelation of the composition; however, the presence of non-bonded poloxamer component modulates the gelation process. The non-bonded poloxamer component  
10 can affect the temperature of transition (from liquid to gel) and the degree of transition and assists in a more controlled and reproducible transition.

Bound poloxamer determination by ethylene oxide (EO) titration. The EO titration was performed as follows. A 5 gm sample of the product polymer was extracted in dichloroethane for three hours at reflux temperatures. The solid is  
15 removed and dried under a vacuum for 12 hours at room temperature. The dry material is then analyzed using ASTM method D 2959-95, "Standard Test Method for Ethylene Oxide Content". The amount of EO in the sample is related to the amount of poloxamer bound to the polymer. The typical result is approximately 15 % by weight of EO.

20 The relative amount of free poloxamer may be varied dependent upon the relative proportions of starting materials and the method of polymerization. Although the residual solids presumably contain only poloxamer which is bonded to the poly(acrylic acid), i.e., a graft co-polymer, the material still shows strong viscosification when it is neutralized and dissolved in water. However, the  
25 temperature of viscosification is increased substantially and the degree of viscosification per gram of total solids is increased by removal of free poloxamer. Thus, the free poloxamer plays a role in modifying the extent and temperature of viscosification. The poloxamer undergoes conformational changes and changes to the critical micelle concentration as a function of temperature. The poloxamer will  
30 change from an open, non-aggregated form to a micellular, aggregated form with

changes in temperature.

Residual acrylic monomer determination by gas chromatography (GC). The residual acrylic acid monomer was determined by GC analysis using a Hewlett Packard GC 5890A, using a HP-FFDAP-TPA 10 m x 0.53 mm x 1 $\mu$ m column. The sample was extracted and run in methanol. Using an internal standard ratio, the sample was compared to a one point calibration. The typical results for this assay were below 70 ppm acrylic acid monomer.

Residual Norpar solvent by GC. The residual Norpar in the sample was determined by GC using the above method and comparing the Norpar peaks to that of a standard. The typical results were below 1.5 wt%.

UV-vis spectrum. Optical clarity data of UV-vis spectrophotometer was obtained. A 1.0% solution in water was prepared and measured at 420 nm. Transmittance (%) was typically greater than 90%.

Differential scanning calorimetry (DSC). The DSC was performed by Massachusetts Material Research, Inc., West Boylston, MA using a temperature ramp from 30 to 350 °C at 5 °C/min. The resolution for the system was set to 4 (1.0°C/min for all slope changes). The assay yielded one endothermic event at 265 °C, typically 270 J/g.

Examples 3-9. This example describes the synthesis of a several reversible thermal gelling polymer network prepared using a variety of poloxamers and poly(acrylic acid). The gelation and the physical properties of the resultant polymer network compositions are reported in Table 2.

Table 2.

example	poloxamer	poloxamer composition	poloxamer: PAA	trans. temp.	comments
3	Pluronic® F88 Prill polyol	2400 MW PPG; 80 wt% PEG; nominal MW 11,400	1:1	48 °C	viscosity response curve shown in Figure 13
4	Pluronic® F127 NF polyol	3600 MW PPG; 70 wt% PEG; nominal MW 12,600	1:1	30 °C	pentaerythritol triallyl ether crosslink agent used
5	Pluronic® P104 polyol	3000 MW PPG; 40 wt% PEG; nominal MW 5,900	1:1	28 °C	viscosity response curve shown in Figure 14
6	Pluronic® P123 polyol	3600 MW PPG; 30 wt% PEG; nominal MW 5,750	1:1	25 °C	viscosity response curve shown in Figure 15
7	Pluronic® F127/Pluronic® F108 polyol blend (1:1)	as above	1:1.7	42 °C	polymer solid formed, dried; resolubilized in neutralizing solution
8	Pluronic® F88 polyol	as above	1:1.7	80 °C	polymer solid formed, dried; resolubilized in neutralizing solution
9	Pluronic® F127/Pluronic® F88 polyol blend (1:1)	as above	1:1.7	85 °C	polymer solid formed, dried; resolubilized in neutralizing solution

Example 10. The following example demonstrates the effect of hydrophilic/hydrophobic ratio on the gelling temperature. Polymer network compositions were prepared from the following poloxamers shown in Table 3.

Table 3. Composition of poloxamers investigated.

triblock polyol polymer composition	MW of PPG block	wt% of PEG block
P103 (PEG) <sub>37</sub> (PPG) <sub>36</sub> (PEG) <sub>37</sub>	3250	50
P104 (PEG) <sub>25</sub> (PPG) <sub>36</sub> (PEG) <sub>25</sub>	3250	40
P105 (PEG) <sub>16</sub> (PPG) <sub>36</sub> (PEG) <sub>16</sub>	3250	30

Table 3 shows that in this series, the fraction of PEG is reduced when the molecular weight of the PPG block is kept constant. Linse (*Macromol.* 26:4437-4449 (1993)) report phase diagrams for these copolymers in water were calculated and it was shown that two-phase boundaries corresponding to the beginning of aggregation are almost unaffected by the molecular mass, given a constant PEG/PPG ratio, whereas these boundaries shifted to lower temperature as the PEG content of the polymer is reduced at constant mass. The strong dependence of the PEG/PPG ratio is a consequence of the differing solubilities of PEG and PPG in water at the elevated temperatures. Thus one would suppose that aggregation that causes viscosification in the responsive polymer network composition should shift to lower temperature as PEG fraction decreases.

The poloxamer (3.0 g) was dissolved in 3.0 g acrylic acid. The solution was deaerated by N<sub>2</sub> bubbling for 20 min. and following addition of the 100 :1 of freshly prepared saturated solution of ammonium persulfate in deionized water was kept at 70°C for 16 h resulting in a strong whitish polymer. A sample of the polymer obtained (0.4 g) was suspended in 40 ml deionized water into which NaOH was added. Suspended responsive polymer network particles were allowed to dissolve under constant stirring. The resulting 1 wt% polymer network solutions were subjected to the viscosity measurement at shear rate of 132 or 13.2 sec<sup>-1</sup> using a SC4-18 spindle. It can be seen from Figure 16 that, firstly, viscosity of the 1 wt%



responsive polymer network solutions before viscosification (at 20-24°C) decreases in the series (PEG)<sub>37</sub>(PPG)<sub>56</sub>(PEG)<sub>37</sub>(F103) > (PEG)<sub>25</sub>(PPG)<sub>56</sub>(PEG)<sub>25</sub>(F104) > (PEG)<sub>16</sub>(PPG)<sub>56</sub>(PEG)<sub>16</sub>(F105) and, secondly, the temperature at which gelation shifts from about 45°C for (PEG)<sub>37</sub>(PPG)<sub>56</sub>(PEG)<sub>37</sub> to about 35°C for (PEG)<sub>25</sub>(PPG)<sub>56</sub>(PEG)<sub>25</sub> and (PEG)<sub>16</sub>(PPG)<sub>56</sub>(PEG)<sub>16</sub>. Both results are in excellent agreement with the theory set forth in Linse.

Example 11. The following example is related to release of and active agent from a poloxamer:poly(acrylic acid) polymer network. Drug loading and kinetics of release of the protein hemoglobin from poloxamer:poly(acrylic acid) polymer network is described.

Synthesis. Pluronic® F127 (3.0 g) was dissolved in 3.0 g acrylic acid. The solution was deaerated by N<sub>2</sub> bubbling for 0.5 h and following addition of 100 Fl of freshly prepared saturated solution of ammonium persulfate (Kodak) in deionized water was kept at 70°C for 16 h resulting in a transparent polymer. The resultant responsive polymer network obtained (5 g) was suspended in 95 ml deionized water into which NaOH was added. The resulting suspension was allowed to swell for 7 days.

Hemoglobin loading and release. A 5 wt% responsive polymer network composition (3 g) was allowed to swell for 16 h in 10 ml of 0.25 mg/ml solution of human hemoglobin (Sigma) in deionized water adjusted to pH 8. The resulting mixture was well shaken and placed into the feed chambers of customized vertical, static, Franz-like diffusion cells made of Teflon. The feed and receiver chambers of the diffusion cells were separated by mesh screens (# 2063). The receiver chamber was continuously stirred by a magnetic bar. The cells were allowed to equilibrate to either 25 or 37°C (in an oven). The feed and receiver phases consisted of 1 g of the hemoglobin-loaded responsive polymer network and 6 ml of phosphate-buffered saline (pH 7.4), respectively. In the control experiment, the feed phase was made of 1 g of 0.25 mg/ml hemoglobin solution. After the feed solution had been loaded into the cell, the kinetic time commenced. Samples of the receiver phase was withdrawn from time to time and their absorbance was measured spectrophotometrically at 400 nm.

To calculate hemoglobin concentrations, corresponding calibration curves (absorbance in PBS versus hemoglobin concentration) were generated. The results of the kinetic experiment are presented in Figure 17. It can be seen that the rate of hemoglobin release from the polymer network was substantially lowered at 37°C when compared to that at 25°C, because of viscosity increase in the polymer network at elevated temperatures (see Figure 1). The protein released from the polymer network composition still retained its native structure, as was determined by comparison of uv-vis spectra of release hemoglobin and natural hemoglobin.

Example 12. The following example is related to release of an active agent from a poloxamer:poly(acrylic acid) polymer network. Drug loading and kinetics of release of the protein lysozyme from a polymer network is reported.

Lysozyme loading and release. A 5 wt% responsive polymer network composition (3 g) was allowed to swell for 16 h in 10 ml of 1 mg/ml solution of chicken egg-white lysozyme (Sigma) and 1.5 mg/ml sodium dodecyl sulfate (Aldrich) in deionized water adjusted to pH 8.5. The resulting mixture was well shaken and placed into the feed chambers of customized vertical, static, Franz-like diffusion cells made of Teflon. The feed and receiver chambers of the diffusion cells were separated by mesh screens (# 2063). The receiver chamber was continuously stirred by a magnetic bar. The cells were allowed to equilibrate to either 25 or 37°C (in an oven). The feed and receiver phases consisted of 1 g of the lysozyme-loaded responsive polymer network and 6 ml of phosphate-buffered saline (pH 7.4), respectively. In the control experiment, the feed phase was made of 1 g of 1 mg/ml lysozyme solution. After the feed solution had been loaded into the cell, the kinetic time commenced. Samples were withdrawn and their absorbance measured spectrophotometrically at 280 nm. A calibration curve was prepared for lysozyme concentration ranging from 0 mg/ml to 0.5 mg/ml in phosphate buffered saline. The results of the kinetic experiment are presented in Figure 18. It can be seen that the rate of lysozyme release from the responsive polymer network composition was substantially lowered at 37°C when compared to that at 25°C, because of viscosity increase in responsive polymer network at elevated temperatures (see Figure 1).

In order to demonstrate the retention of the enzymatic activity of lysozyme, the lysozyme released from the responsive polymer network composition was assayed using *Micrococcus lysodeikticus* cells and compared to that of original lysozyme. The enzymatic activity of lysozyme was the same, within the error of the assay (15%), as that of the original lysozyme. Control without lysozyme in presence of sodium dodecyl sulfate did not show any appreciable lysis of the cells.

Example 13. The following example is related to release of an active agent from a poloxamer:poly(acrylic acid) polymer network. Drug loading and kinetics of release of insulin from a responsive polymer network composition is reported.

Insulin loading and release. A 5 wt% responsive polymer network composition (3 g) was allowed to swell for 16 h in 10 ml of 5 mg/ml solution of bovine  $\text{Zn}^{2+}$ -insulin (Sigma) in deionized water adjusted to pH 7. The resulting mixture was well shaken and placed into the feed chambers of customized vertical, static, Franz-like diffusion cells made of Teflon. The feed and receiver chambers of the diffusion cells were separated by mesh screens (# 2063). The receiver chamber was continuously stirred by a magnetic bar. The cells were allowed to equilibrate to either 25 or 37°C (in an oven). The feed and receiver phases consisted of 1 g of the insulin-loaded responsive polymer network and 6 ml of phosphate-buffered saline (pH 7.4), respectively. In the control experiment, the feed phase was made of 1 g of 5 mg/ml insulin solution. After the feed solution had been loaded into the cell, the timing commenced. Samples were withdrawn and their absorbance was measured spectrophotometrically at 280 nm. A calibration curve was prepared for insulin concentration ranging from 0 mg/ml to 1.25 mg/ml in phosphate buffered saline. The results of the kinetic experiment are presented in Figure 19. The rate of insulin release from responsive polymer network was substantially lowered at 37°C when compared to that at 25°C, because of viscosity increase in responsive polymer network at elevated temperatures (see Figure 1).

Example 14. This example demonstrates the preparation of a sterile reversibly gelling polymer network aqueous composition and the stability of the composition to sterilization. The polymer network is prepared as described in Example 1, except that

the composition is prepared at 2 wt% Pluronic® F127 polyol/poly(acrylic acid). After dissolution of the 2 wt% polymer network in water, the viscosity is measured. The composition then is sterilized by autoclaving at 121°C, 16 psi for 30 minutes.

Viscosity is determined after sterilization. The corresponding curves for viscosity (a) before and (b) after sterilization are shown in Figure 20 and establish that minimal change in the viscosity profile of the material has occurred with sterilization.

Examples 15-30. These examples show additives which may be used to affect the transition temperature overall viscosification of the polymer network composition.

A 1 wt% polymer network was prepared in deionized water at pH 7 in which a variety of additives were included in the composition. The effect of the additive was determined by generation of a Brookfield viscosification curve. Results are reported in Table 4.

Table 4.

Example No.	Additive (wt%)	Effect of additive on:	
		transition temp. (°C)	final viscosity (% change)
15	1,2-methyl pyrrolidone (5)	I (1.8)	N
16	Rhodapex CO-436 (2)	I (1.6)	N
17	Dow Corning 190 (2)	I (5)	I (150)
18	isopropyl alcohol (0.5)	I (3.1)	I (45)
19	Pluronic® L122 (1)	D (4.4)	D (13)
20	Pluronic® F88 (1)	N	I (41)
21	Tween 80 (0.5)	N	I (18)
22	Germaben® II (1)	D (9)	I (100)
23	Iconol NP-6 (1)	D (9)	I (500)
24	Plurafac C-17 (0.5)	I (5.2)	D (36)
25	Dow Corning 193 (0.75)	I (4.1)	D (12)
26	glycerin (5)	D (2)	N
27	UC 50-HB- 170/EO/PO random copolymer (0.5)	N	N
28	PVP K15 (1)	N	N
29	MAPTAC (1)	N	D (8)
30	potassium chloride (0.25)	N	D (34)

I = increase; D = decrease; and N = no change

Example 31. Because of the surfactant nature of the polymer network composition coupled with the gelation effect of the polymer network composition, it is possible to prepare formulation which are 100% water-based, but which are lubricous and thick.

5        Formulations including a nonionic surfactant formulation: An O/W (oil-in-water) emulsion was made by combining the following ingredients utilizing conventional mixing techniques:

Table 5.

Ingredient	% w/w
10 % wt. 1:1 responsive polymer network as prepared in Example 1	20.0
Emulsifying Wax NF <sup>1</sup>	2.5
Mineral Oil	5.0

<sup>1</sup> Polowax available from Croda

Into a vessel equipped with a high efficiency homogenizer, the formula amount of all ingredients is added, water is added to 100% w/w and allowed to mix to homogeneity. This formulation contains a nonionic surfactant and gives an emulsion that is fluid at room temperature but viscifies above 32°C.

20        Formulations including a cationic surfactant formulation: An O/W (oil-in-water) emulsion was made by combining the following ingredients utilizing conventional mixing techniques:

Table 6.

Ingredient	% w/w
10 % wt. 1:1 responsive polymer network as prepared in Example 1	20.0
Behenrimonium Methosulfate (and) Cetearyl alcohol <sup>1</sup>	2.5
Mineral Oil	5.0

<sup>1</sup> Incroquat Behenyl TMS available from Croda

Into a vessel equipped with a high efficiency homogenizer, the formula amount

of all ingredients is added and allowed to mix to homogeneity. This formulation contains a cationic surfactant and gives an emulsion that is fluid at room temperature but viscifies above 32°C.

Formulations including an anionic surfactant formulation: An O/W (oil-in-water) emulsion was made by combining the following ingredients utilizing conventional mixing techniques:

Table 7.

Ingredient	% w/w
10 % wt. 1:1 responsive polymer network as prepared in Example 1	20.0
Cetearyl Phosphate (and) Cetearyl alcohol <sup>1</sup>	2.5
Mineral Oil	5.0

<sup>1</sup> Crodafos CES available from Croda

Into a vessel equipped with a high efficiency homogenizer, the formula amount of all ingredients is added, water is added to 100% w/w and allowed to mix to homogeneity. This formulation contains a anionic surfactant and gives an emulsion that is fluid at room temperature but viscifies above 32°C.

Example 32. Acne Medication: An oil-free, clear, anti-acne treatment is made by combining the following ingredients utilizing conventional mixing techniques:

Table 8.

Ingredient	% w/w
10 % wt. 1:1 responsive polymer network prepared as in Example 1	20.0
Glycerin USP	5.0
Salicylic Acid	2.0
DL-Panthenol	0.5
Germaben® II <sup>1</sup>	0.1
Disodium EDTA	0.2
USP Purified Water	72.2

<sup>1</sup> Germaben®II available from Sutton Laboratories

To one vessel, equipped with a Lightnin' Mixer with a 3 blade paddle prop,

the full amount of USP Purified Water to 100% w/w is added. While maintaining the temperature, with moderate to vigorous mixing, the formula amount of Disodium EDTA, Citric Acid, DL-Panthenol, Glycerin, Salicylic Acid, and Germaben<sup>®</sup> II is added. These materials are allowed to dissolve at 50°C. After dissolution, the vessel  
5 is then cooled to 20°C. To another vessel, equipped with a high efficiency homogenizer, the formula amount of responsive polymer network is added. The responsive polymer network vessel is then cooled to 4°C. After cooling, while vigorously homogenizing, the contents of the first vessel is added to the second vessel, and allowed to mix to homogeneity.

10 The composition displays a flowable clear jelly appearance with excellent spreadability and absorption characteristics at room temperature, and after heating the formulation to 32°C, the composition thickens to a gel-like consistency.

Example 33. (a) Oil-free Moisturizer (formulation I): An oil-free, lubricous  
15 moisturizer was made by combining the following ingredients utilizing conventional mixing techniques:



Table 9.

Ingredient	% w/w
10% wt 1:1 responsive polymer network as prepared in Example 1	20.0
Glycerin USP	5.0
PPG-2 Myristyl Ether Propionate	3.0
DL-Panthenol	0.5
Germaben® II <sup>1</sup>	0.1
Disodium EDTA	0.2
Citric Acid	0.01
USP Purified Water	71.19

<sup>1</sup> Germaben® II available from Sutton Laboratories

The above ingredients were added and processed as described above for the acne composition. The composition displayed a flowable creamy lotion appearance with excellent emolliency, spreadability and absorption characteristics at room temperature. After heating the formulation to above 26°C, the composition thickened to a gel-like consistency. The viscosity vs. temperature curve is shown in Figure 21 and demonstrates that addition of adjuvants to the composition significantly enhances the responsive polymer network maximum viscosity (> 900,000 cps). The use of the poloxamer:poly(acrylic acid) polymer network in the formulation also imparts a unique viscosification effect after application to the skin, which is not evident in typical commercial O/W emulsion formulations (See, Figure 21b).

(b) Oil-free Moisturizer (formulation II): An oil-free, lubricious moisturizer was made by combining the following ingredients utilizing conventional mixing techniques:

Table 10.

Ingredient	% w/w
1:1 polymer network as prepared in Example 1	2.0
Glycerin USP	5.0
Carbopol 980	1.0
D-panthenol, propylene glycol	1.0
Preservative	1.0
Hydrolyzed protein (and) hyaluronic acid	0.5
Sodium hydroxide	0.2
USP Purified Water	90

The above ingredients were added and processed as described above for the acne composition. The composition displayed a flowable creamy lotion appearance with excellent emolliency, spreadability and absorption characteristics at room temperature. After heating the formulation to 26°C, the composition thickens to a gel-like consistency. The addition of adjuvants to the composition significantly enhances the polymer network maximum viscosity.

Example 34. Sunscreen Lotion. An oil-free, lubricious sunscreen lotion was made by combining the following ingredients utilizing conventional mixing techniques:

Table 11.

Ingredient	% w/w
1:1 polymer network as prepared in Example 1	2.0
Glycerin USP	8.0
Carbopol 980	1.0
Parsol MCX	7.0
Myristyl Ether Propionate	5.0
Preservative	1.0
Cyclomethicone	1.0
Sodium hydroxide	0.2
USP Purified Water	74

The above ingredients were added and processed as described above for the acne composition. The composition displayed a flowable creamy lotion appearance with excellent emolliency, spreadability and absorption characteristics at room temperature. After heating the formulation to above 26°C. the composition thickened to a gel-like consistency. The addition of adjuvants to the composition significantly enhances the polymer network maximum viscosity.

Example 35: Facial mask. A face mask was made by combining the following ingredients utilizing conventional mixing techniques:

Table 12.

Ingredient	% w/w
1:1 polymer network as prepared in Example 1	1.0
Polyvinyl alcohol	6.0
Polyvinylpyrrolidone (20%)	5.0
D-panthenol, propylene glycol	1.25
Propylene glycol	1.25
USP Purified Water	85.5

The above ingredients were added and processed as described above for the acne composition. The composition displayed a flowable creamy lotion appearance with excellent emolliency, spreadability and absorption characteristics at room temperature. After heating the formulation to above 26°C, the composition thickened to a gel-like consistency. The addition of adjuvants to the composition significantly enhances the polymer network maximum viscosity.

Example 36. Facial toner. A face mask was made by combining the following ingredients utilizing conventional mixing techniques:

Table 13.

Ingredient	% w/w
1:1 polymer network as prepared in Example 1	0.01
Hydroxyethyl ceryldimonium phosphate	1.00
PEG-40 hydrogenated castor oil	2.00
D-panthenol, propylene glycol	0.50
Glycerin	2.00
Witch hazel extract	5.00
USP Purified Water	88.49

The above ingredients were added and processed as described above for the acne composition. The composition displayed a flowable appearance with excellent emolliency, spreadability and absorption characteristics at room temperature. After heating the formulation to above 26°C, the composition thickened to a gel-like consistency. The addition of adjuvants to the composition significantly enhances the polymer network maximum viscosity.

Example 36. Solubilization studies of model hydrophobic agents in the poloxamer: poly(acrylic acid) polymer network: estradiol and progesterone. This example is presented to demonstrate the solubilization of a hydrophobic agent in the polymeric network. Progesterone and estradiol were used as the hydrophobic agents in this model solubilization study.

Acrylic acid (99%), fluorescein (98%),  $\beta$ -estradiol (98%), and progesterone (98%) were all obtained from Aldrich and used as received. Pluronic® F127 NF was obtained from BASF. Poly(oxyethylene-b-oxypropylene-b-oxyethylene)-g-poly(acrylic acid) copolymers (responsive polymer network) were synthesized by free-radical polymerization of acrylic acid in the presence of poloxamer as described above. The polymer network copolymers discussed here were composed of about 1:1 ratio of PAA to poloxamer. The rheological properties of polymer network were assessed using LVDV-II+ and RVDV-II+ Brookfield viscometers. The microscopic light scattering of 21 nm poly(styrene) latex particles in deionized water and 1 w% reversibly gelling polymer network was measured using He-Ne laser as described previously (See, Matsuo, E.S., Orkisz, M., Sun, S.-T., Li, Y., Tanaka, T., Macromolecules, 1994, 27, 6791). The solubility of fluorescein and hormones in aqueous solutions was measured by the equilibration of excess solubilize with the corresponding solution following removal of undissolved species by centrifugation and filtration. Hydrophobic agents were assayed spectrophotometrically at 240 (progesterone) or 280 nm (estradiol), or by using 70/30 w/w H<sub>2</sub>SO<sub>4</sub>/MeOH (Tsilifonis-Chafetz reagent). In vitro hormone release studies were conducted using thermostatted, vertical Franz cells. Spunbonded polypropylene microfilters (micron retention, 15-20) were used as a membrane separating feed and receiver phases in

Franz cells. The responsive polymer network, water, ethanol, and 20% PEG in water were observed to wet the membrane. The receiver solutions consisted of 20 w% PEG in water (pH 7) and were stirred by magnetic bars. The feed phases composed of responsive polymer network were loaded with either estradiol or progesterone. Each hormone was dissolved in ethanol and the resulting solution was added into the responsive polymer network.

Equilibrium solubility vs. temperature plots for estradiol and progesterone (partition coefficient octanol/water (P) 7200 and 5888, respectively, in aqueous solutions of Pluronic® F127 polyol and responsive polymer network are presented in Figure 22. It can be seen that increasing temperature and concentration (C) of polymers in the solution raises the amount of the hormone dissolved. In Figure 22a, vertical lines represent critical micellar temperatures (CMT) for corresponding Pluronic F127 polyol solutions. It is interesting to note that the slope of the solubility-temperature plots increased as temperature reached CMT, indicating that solubilization in the Pluronic solutions was predominantly due to the formation of micelles. Similar trend was observed in the responsive polymer network solutions. The S values in 5% aqueous solutions of branched PAA did not exceed 15 and 40  $\mu\text{g/mL}$  at 60 °C for estradiol and progesterone, respectively. The solubility values found for responsive polymer network were the same as S in parent Pluronic solutions of equivalent concentrations. Therefore, it may be suggested that solubilization behaviors of the responsive polymer network are governed by the properties of the poloxamer incorporated into it. Thermodynamic parameters of the solubilization process with responsive polymer network were calculated using the same approximations as in the micellar solubilization with Pluronic polyols. See, Saito, Y., Kondo, Y., Abe, M., Sato, T., Chem.Pharm.Bull., 1994, 42, 1348. Namely, partition coefficient P was estimated from equilibrium solubilities of estradiol in responsive polymer network and water:

$$P = S_{\text{SH}}/S_{\text{W}} \quad (13)$$

by extrapolating the solubility plots of the steroid in Figure 22 to 100 % responsive polymer network. Using P values obtained from data in Figure 23, we calculated the

standard free energy change ( $\Delta G$ ), standard enthalpy of solubilization ( $\Delta H$ ), and standard entropy of solubilization ( $\Delta S$ ) using the following expressions:

$$\Delta G = -RT \ln P; \Delta H = -R \Delta \ln P / \Delta(1/T); \Delta S = (\Delta H - \Delta G)/T \quad (14)$$

Thermodynamic parameters obtained along with P values are given in Table 13.

5 Apparent partition coefficients and thermodynamic parameters for solubilization of estradiol by responsive polymer network.

Table 13.

T, K	P=SSH/S	$\Delta G$ kJ/mol	$\Delta H$ kJ/mol	$\Delta S$ J/mol
277	490	-14.3	4.72	68.6
293	520	-15.2		52.0
310	660	-16.7		53.9
323	660	-17.4		54.0
333	660	-18.0		54.0

15

Negative  $\Delta G$  values indicate spontaneous solubilization at all temperatures, whereas positive  $\Delta H$  shows that the solubilization was endothermic, similar to the solubilization of estriol, as well as indomethacin, by the poloxamer. Notably,  $\Delta S$  of solubilization was always positive, suggesting that the more ordered water molecules surrounding hydrophobic estradiol molecules moved to the less ordered bulk phase when the estradiol was transferred to the hydrophobic core of PPG segments in responsive polymer network. The aggregation of the PPG segments at elevated temperatures provides not only temporary cross-linking in the gel, but also a thermodynamically "friendly" environment for the hydrophobic drugs. Indeed, one can express the free energy of formation of the aggregate core-water interface in responsive polymer network as:

25

$$\Delta G = [\sigma P_w(1 - \phi) + \sigma W_D \phi](4\pi R^2/n) \quad (15)$$

where  $\sigma P_w$  and  $\sigma W_D$  are the interfacial tensions between pure PPO polymer and water and between water and the drug, respectively;  $\phi$  is the volume fraction of the drug within PPO core; R is the effective radius of the core, and n is the aggregation number.

30

Equation (3) shows that solubilization of a hydrophobic drug of high  $\sigma_{WD}$  should increase the stability of the aggregate. The solubilization process was found to decrease the critical micellization concentration and substantially increase the micellar core radius in Pluronic surfactants (Hurter, P.N. *et al.*, "In Solubilization in Surfactant Aggregates", Christian, S.D., Ed., Marcel Dekker, New York, 1995). A similar trend is indicated by the lowering the onset of gelation of the responsive polymer network upon solubilization of fluorescein (LogP 2.1) (Figure 24). The solubilization of hydrophobic drugs by responsive polymer network, analogous to the micellar solubilization of drugs by poloxamer, suggests that the responsive polymer network can be an effective vehicle in drug delivery.

Our *in vitro* study of hormone release from responsive polymer network shows an increase in the initial transport rate with either decreasing total polymer concentration in the formulation or decreasing temperature (Figure 25). These effects are related to the changes in macroscopic viscosity of the responsive polymer network, which erodes more rapidly from the feed phase through the membrane into the receiver compartment as the viscosity decreases (Figure 26). The degree of the responsive polymer network erosion was measured by weighing hormone-loaded responsive polymer network before and after kinetic experiment.

Figure 27 shows that the relative amount of progesterone penetrating into the receiver phase decreased 4-fold with the increase of total polymer concentration, whereas the total relative amount of progesterone stayed almost constant as total polymer concentration in the responsive polymer network increased. This result shows the existence of two routes of transport of hydrophobic drugs in our model system. Firstly, the drug incorporated into aggregates within the responsive polymer network system can flow through the membrane along with the erosion of the responsive polymer network; secondly, the drug not associated with the responsive polymer network aggregates can diffuse out of the responsive polymer network in the feed phase. The second process should not be related to the viscosity of the responsive polymer network. Indeed, the dynamic light scattering experiment shows no dramatic change of diffusivity of poly(styrene) latex particles in the responsive polymer



network as temperature rises thereby increasing macroscopic viscosity more than 10-fold (Figure 28). This result indicates that the viscosity of the responsive polymer network is essentially unaffected on the microscopic scale.

5

Appendix A attached.

## APPENDIX A

# Cosmetic Bench Reference Function Definitions

<b>Abrasive:</b> abrades, smooths, polishes	<b>Emollient:</b> softens, smooths skin
<b>Absorbent powder:</b> takes up liquids, sponge-like action	<b>Emulsifier:</b> a surface-active agent (surfactant) that promotes the formation of water-in-oil or oil-in-water emulsions
<b>Absorption base:</b> forms water-in-oil emulsions	<b>Enzymes:</b> complex proteins produced by living cells that catalyze biochemical reactions at body temperature
<b>Acidulent:</b> acidifies, lowers pH, neutralizes alkalis	<b>Fiber:</b> strands of natural or synthetic polymers; for instance, cotton, wool, silk, nylon, polyester
<b>Amphoteric:</b> capable of reacting chemically either as an acid or a base; amphoteric surfactants are compatible with anionic and cationic surfactants	<b>Film former:</b> solution of a polymer that forms films when the solvent evaporates after application to a surface
<b>Analgesic:</b> relieves pain	<b>Fixative:</b> fixes or sets perfumes; retards evaporation; promotes longer lasting aroma
<b>Antacid:</b> neutralizes stomach acidity	<b>Flavor:</b> imparts a characteristic taste (and aroma) to edible foods and drinks; sometimes used in lip products
<b>Antibacterial:</b> destroys/inhibits the growth/reproduction of bacteria	<b>Foam booster:</b> enhances quality and quantity of lather of shampoos
<b>Anti-caking:</b> prevents or retards caking of powders; keeps powders free-flowing	<b>Foamer:</b> a surface-active agent (surfactant) that produces foam; an emulsion of air-in-water
<b>Anti-dandruff:</b> retards or eliminates dandruff	<b>Foam stabilizer:</b> see Foam booster
<b>Antifoam:</b> suppresses foam during mixing	<b>Fungicide:</b> inhibits or destroys growth of fungi
<b>Anti-inflammatory:</b> reduces, suppresses, counteracts inflammation	<b>Gellant:</b> a gelling agent; forms gels; includes a wide variety of materials such as polymers, clays and soaps
<b>Anti-irritant:</b> reduces, suppresses or prevents irritation	<b>Glosser:</b> furnishes a surface luster or brightness; usually used in lip or hair products
<b>Antimicrobial:</b> destroys, inhibits or suppresses the growth of microorganisms	<b>Hair colorant:</b> see Colorant
<b>Antioxidant:</b> inhibits oxidation and rancidity	<b>Hair conditioner:</b> see Conditioner
<b>Antiperspirant:</b> reduces or inhibits perspiration	<b>Hair dye:</b> imparts a new permanent or semi-permanent color to hair
<b>Antipruritic:</b> reduces or prevents itching	<b>Hair-set polymer:</b> polymer and/or resins used to maintain desired hair shape
<b>Antiseptic:</b> inhibits the growth of microorganisms on the skin or on living tissue	<b>Hair-set resin:</b> see Hair-set polymer
<b>Antistat:</b> reduces static by neutralizing electrical charge on a surface	<b>Hair waving:</b> see Reducing agent and Neutralizer
<b>Astringent:</b> contracts organic tissue after application	<b>Humectant:</b> absorbs, holds and retains moisture
<b>Binder:</b> promotes cohesion of powders	<b>Hydrotrope:</b> enhances water solubility
<b>Bleaching agent:</b> lightens color, oxidizing agent	<b>Intermediate:</b> basic chemicals which are chemically modified to obtain the desired function
<b>Botanical:</b> natural plant derivative	<b>Lathering agent:</b> a surface active agent (surfactant) that forms a foam or lather on mixing with air in solution; see also Foamer
<b>Buffer:</b> helps maintain original pH (acidity or basicity) of a preparation	<b>Lubricant:</b> reduces friction, smooths, adds slip
<b>Carrier:</b> a vehicle or base used for a preparation	<b>Moisture barrier:</b> retards passage of moisture or water
<b>Chelate:</b> form a complex with trace-metal impurities, usually calcium or iron	<b>Moisturizer:</b> aids in increasing the moisture content of the skin through humectant or barrier action
<b>Colorant:</b> adds color, may be a soluble dye or an insoluble pigment	<b>Neutralizer:</b> an oxidizing agent used in hair waving that stops the action of the reducing agent and re-establishes the disulfide linkages in hair
<b>Conditioner:</b> improves condition of skin and hair	<b>Oil absorbent:</b> see Absorbent powder
<b>Coupling agent:</b> aids in solubilization or emulsification of incompatible components	<b>Ointment base:</b> an anhydrous mixture of oleaginous components used as a vehicle for medicaments
<b>Decolorant:</b> removes color by adsorption, bleaching or oxidation	<b>Opacifier:</b> opacifies clear liquids or solids
<b>Denaturant:</b> used to denature ethyl alcohol	<b>Oxidant:</b> oxidizing agent, neutralizes reducing agents, bleaching agent
<b>Dental powder:</b> powdered dentifrice	<b>Pearlant:</b> imparts a pearlescent texture and luster
<b>Deodorant:</b> destroys, masks or inhibits formation of unpleasant odors	<b>Perfume solvent:</b> see Solvent and Solubilizer
<b>Depilatory:</b> removes hair chemically	
<b>Detergent:</b> a surface-active agent (surfactant) that cleans by emulsifying oils and suspends particulate soil	
<b>Disinfectant:</b> destroys pathogenic microorganisms	
<b>Dispersant:</b> promotes the formation and stabilization of a dispersion or suspension	
<b>Dye stabilizer:</b> see Stabilizer	

**Peroxide stabilizer:** see Stabilizer

**Pigment:** a finely powdered insoluble substance used to impart color, luster or opacity

**Plasticizer:** plasticizes (makes more flexible) polymeric films or fibers

**Polish:** smoothes; adds gloss and luster

**Polymer:** a very high molecular weight compound consisting of repeating structural units

**Powder:** a solid in the form of fine particles

**Preservative:** protects products from spoilage by microorganisms

**Propellant:** pressurized gas in a container used to expel the contents when pressure is released by opening a valve

**Protein:** naturally occurring complex combinations of amino acids

**Reducing agent:** reduces a chemical compound usually by donating electrons; neutralizes oxidizing agents

**Refatting agent:** adds oils/increases to the surface of substrates, e.g., skin and hair

**Resin:** nonvolatile solid or semisolid organic substances obtained from plants as exudates or prepared by polymerization of simple molecules

**Sequestrant:** forms coordination complexes with multivalent positive ions

**Silicone:** polymeric organic silicon compounds which are water resistant

**Skin protectant:** protects skin from environmental

**Solubilizer:** solubilizes, usually into aqueous vehicles, normally insoluble materials, such as fragrances, flavors, oils, etc.

**Solvent:** usually liquids capable of dissolving other substances

**Stabilizer:** added to stabilize emulsions and/or suspensions

**Stimulant:** produces a temporary increase in the functional activity of an organism or any of its parts

**Surfactant (surface-active agent):** lowers surface tension between two or more incompatible phases; soaps, detergents, wetting agents, solubilizing agents and emulsifying agents are typical surfactants; surfactants are classified as anionic, cationic, nonionic and amphoteric; anionic surfactants are negatively charged, cationic surfactants have no electrical charge

**Suspending agent:** keeps finely divided solid particles in suspension

**Sweetener:** sweetens to provide a more pleasant taste

**Tanning accelerator:** accelerates the tanning of skin

**Thickener:** thickens or increases viscosity/consistency

**Thixotrope:** the property of certain gels and emulsions of becoming more fluid or less viscous when shaken or stirred

**UV absorber:** used as a sunscreen and to protect preparations from degradation by UV radiation

**UVA absorber:** absorbs in the range 320-400 nanometers (nm)

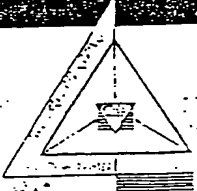
**UVB absorber:** absorbs in the range 290-320 nanometers (nm)

**Wax:** any of numerous substances of plant, animal or synthetic origin that contain principally esters of higher fatty acids and higher fatty alcohols; free fatty alcohols, fatty acids and hydrocarbons may also be present; waxes derived from petroleum products are mainly high-molecular-weight hydrocarbons

**Wetting agent:** a surface-active agent (surfactant) that lowers the surface and interfacial tension, facilitating the wetting of surfaces

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

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# Functions

## Abrasive

Adzuki beans  
Almond (*Prunus amygdalus*) meal, shell granules  
Aluminum silicate  
Apricot (*Prunus armeniaca*) kernel powder, shells  
Hydrated silica  
Jojoba (*Buxus chinensis*) seed powder  
Luffa cylindrica  
Olive stone granules  
Oyster shell powder  
Peach (*Prunus persica*) pit powder  
Peach (*Prunus persica*) stone granules  
Polyethylene  
Polyethylene HEC granules  
Polyethylene oxidized, P. spheres  
Polystyrene  
Pumice  
Rice (*Oryza sativa*) bran  
Silica and S. colloidal  
Sodium chloride  
Walnut (*Juglans regia*) shell powder

## Absorption base

1,2,6-Hexanetriol  
Kaolin  
Petrolatum  
Rice (*Oryza sativa*) starch  
Soy (*Glycine soja*) sterol  
Zeolite

## Absorbent powder

Corn (*Zea mays*) starch  
Maltodextrin  
Nylon-12  
Oat (*Avena sativa*) bran, flour, meal  
Zeolite

## Acidulant

Acetic acid  
Citric acid  
Fumaric acid  
Glutamic acid  
Glycolic acid

Hydrochloric acid  
Lactic acid  
Nitric acid  
Phosphoric acid  
Sodium bisulfate  
Sulfuric acid  
Tartaric acid

## AHA

Apple (*Pyrus malus*) extract  
Apricot (*Prunus armeniaca*) kernel powder  
Citric acid  
Ethyl lactate  
Glycolic acid  
Lactic acid  
Malic acid  
Sodium lactate  
Tartaric acid

## Antiacne

Clays (white, yellow, red, green, pink)  
Perfluorodecalin  
Salicylic acid  
Sulfur

## Anti-aging

Basil (*Ocimum basilicum*) extract  
Carrot (*Daucus carota*) extract  
Catalpa kaempferi extract  
Ceramide J3 (liquid soy extract)  
Crataegus cuneata extract  
Eugenia jambolana extract  
Fomes fomentarius extract  
Fomistopsis pinicola extract  
Ganoderma lucidum oil  
Ginseng (*Panax ginseng*) extract  
Hyaluronic acid  
Hydrolyzed serum protein  
Hydrolyzed soy flour  
Isachne pulchella extract  
Lactoferrin  
Lady's Thistle (*Silybum marianum*) extract  
Ligusticum jeholense extract

Marine collagen  
Mushroom (*Coriolus versicolor*) extract  
Musk rose (*Rosa moschata*) oil  
Perfluorodecalin  
Quaternium-51  
Rubus thunbergii extract  
Serum protein  
Stenocalyx micallii extract  
Tricholoma matsutake extract

## Antibacterial

Ammonium iodide  
Chlorhexidine  
Chlorhexidine diacetate, C. digluconate  
Chlorhexidine dihydrochloride  
Chlorphenesin  
Hexamidine diisethionate  
Hexidine  
Iceland moss (*Cetraria islandica*) extract  
Lactoferrin  
Laurylmonium bromide, L. chloride  
Laurmonium chloride  
Laurylpyridinium chloride  
Mauritiella armata extract  
Mushroom (*Cordyceps sabolifera*) extract  
Orange blossom extract  
Orange (*Citrus aurantium dulcis*) peel extract  
PEG-42 Ebitko ceramides extract  
Peppermint (*Mentha piperita*) extract  
Phellodendron (*Phellodendron amurense*) extract  
Pine (*Pinus sylvestris*) needle extract  
Polymethoxy bicyclic oxazolidine  
Quaternium 73  
Rubus thunbergii extract  
Tea tree (*Melaleuca alternifolia*) oil  
Triclocarban  
Undecylenic acid

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Calcium stearate  
Distarch phosphate  
Hydrated silica

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Allantoin    Aloe Vera

## Functions

<p>Kaolin Magnesium myristate, M. silicate Polyethylene, micronized Silica silylate Sodium aluminum silicate Zinc stearate</p> <p><b>Anticaries agent</b> Cetylamine hydrofluoride Olaflur Sodium fluoride Stearyl trihydroxyethyl propylenediamine dihydrofluoride</p> <p><b>Anticellulite</b> Aminophylline Bladderwrack (<i>Fucus vesiculosus</i>) extract Butcherbroom (<i>Ruscus aculeatus</i>) extract Carcinia cambogia extract Fomes fomentarius extract Fomitisopsis pinicola extract Ivy extract Mushroom (<i>Coriolus versicolor</i>) extract TEA-hydroiodide Tricholoma matsutake extract</p> <p><b>Antidandruff</b> Burdock (<i>Arcium lappa</i>) extract Chloroxylenol Corydalis ambigua extract Disodium undecylenamide MEA-sulfosuccinate Ginger root extract Ioga edulis extract Mauritiella armata extract Myristalkonium saccharinate PEG-6 undecylenate Pirocione olamine Resorcinol Rosemary (<i>Rosmarinus officinalis</i>) extract Sodium shale oil sulfonate Stenocalyx micallii extract Undecylenamide DEA Willow (<i>Salix alba</i>) bark extract Zinc pyrithione</p> <p><b>Antifungal</b> Black walnut (<i>Juglans nigra</i>) extract Coneflower (<i>Echinacea angustifolia</i>) extract Orange blossom extract Pfafia paniculata extract</p> <p><b>Anti-inflammatory</b> Allantoin polygalacturonic acid Bisabolol Black poplar (<i>Populus nigra</i>) extract Brassica rapa-depressa extract Butcherbroom (<i>Ruscus aculeatus</i>) extract Calendula officinalis extract Catapa baccifera extract Celastus paniculata extract Ceramide 33 (liquid soy extract) Chaparral (<i>Larrea mexicana</i>) extract Coneflower (<i>Echinacea angustifolia</i>) extract Coneflower (<i>Centaurea cyanus</i>) extract Dipotassium glycyrrhizinate Euphorium fortunei extract Euphrasia officinalis extract Ficus racemosa extract Golden seal (<i>Hydrastis canadensis</i>) root extract Guaiaculene Horse chestnut (<i>Aesculus hippocastanum</i>) extract Jujube (<i>Zizyphus jujuba</i>) extract Laminaria japonica extract Licorice (<i>Glycyrrhiza glabra</i>) extract Ligusticum sibiricum extract Masticaria (<i>Chamomilla recutita</i>) extract Melaleuca uncinata extract Melia azadirachta extract</p>	<p>Mulberry (<i>Morus nigra</i>) extract Niacinamide ascorbate Orange (<i>Citrus aurantium dulcis</i>) peel extract Orange blossom extract Palmetto extract Palmitoyl collagen amino acids Passion flower (<i>Passiflora laurifolia</i>) fruit extract Paulownia imperialis extract Salicylic acid Shea butter (<i>Burtyrospermum parkii</i>) Sodium carboxymethyl beta-glucan Soy (<i>Glycine soja</i>) protein Stearyl glycyrrhizinate Stenocalyx micallii extract Tocopheryl acetate, T. nicotinate Trichomonas japonica extract Willow (<i>Salix alba</i>) extract Witch hazel (<i>Hamamelis virginiana</i>) extract Withania somniferum extract Yarrow (<i>Achillea millefolium</i>) extract Zinc lactate</p> <p><b>Anti-irritant</b> Acetyl monoethanolamine Allantoin Allantoin acetyl methionine, A. glycyrrhizic acid Azelaic acid MEA Betaine Calendula officinalis extract Cocamidopropyl betaine Coceth-7 carboxylic acid Cornflower (<i>Centaurea cyanus</i>) extract Diisostearyl dimer dilinoleate Dipalmitoyl cystine Green tea extract Hydrolyzed sweet almond protein Hydroxypropyltrimonium gelatin Lauroyl collagen amino acids L-Lysine lauroyl methionine Mallow extract Masticaria (<i>Chamomilla recutita</i>) extract Palmitoyl hydrolyzed milk protein Palmitoyl hydrolyzed wheat protein Palmitoyl keratin amino acids PEG-12 palm kernel glycerides PEG-25 glyceryl tallowate PEG-30 glyceryl monocoate PEG-60 almond glycerides PEG-78 glyceryl cocoate PEG-82 glyceryl tallowate PEG-200 glyceryl tallowate Propionyl collagen amino acids PVP Saccharomyces lysate extract Sodium C12-15 pareth-15 sulfonate Sodium lauroamphosulfate Soy (<i>Glycine soja</i>) protein Undecylenoyl collagen amino acids Valerian (<i>Valeriana officinalis</i>) extract</p> <p><b>Antimicrobial</b> Benzalkonium chloride Benzoic acid Benzyl alcohol Bromochlorophene 2-Bromo-2-nitropropane-1,3-diol Burylparaben Capryloyl collagen amino acids Capryloyl glycine, C. keratin amino acids Capran Cetethyldimonium bromide Cetyl pyridinium chloride Chlorothymol Chloroxylenol Citron oil Copper PCA Dichlorobenzyl alcohol Dilauryldimonium chloride</p>	<p>Domiphen bromide Ethylparaben Eucalyptus (<i>Eucalyptus globulus</i>) extract Fenel (<i>Foeniculum vulgare</i>) extract Garlic (<i>Allium sativum</i>) extract Glyceryl caprylate, G. laurate Hexamidine diisethionate Hioctinol Hoseysuckle (<i>Lonicera caprifolium</i>) extract Lichen (<i>Usnea barbata</i>) extract Myristalkonium chloride Pentylene glycol Phenethyl alcohol Phenol Phenoxyethanol Phenoxyisopropanol Phenyl mercuric acetate, P.m. benzoate, P.m. borate o-Phenylphenol Polymethoxy bicyclic oxazolidine Potassium sorbate Propylparaben Ricinalamodopropyltrimonium ethosulfate Sage (<i>Salvia officinalis</i>) extract Sodium benzoate, S. pyrithione Sodium ricinoleate, S. shale oil sulfonate Thimerosal Thyme (<i>Thymus vulgaris</i>) extract Thymol Triclocarban Triclosan Undecylenamidopropyltrimonium methosulfate Undecylenic acid Zinc oxide, Z. PCA Zinc pyrithione, Z. undecylenate</p> <p><b>Antioxidant</b> Ascorbic acid A. polypeptide Ascorbyl oleate, A. palmitate Beta-carotene BHA BHT t-Buryl hydroquinone Dilauryl thiodipropionate Dimyristyl thiodipropionate Disodium EDTA Distearyl thiodipropionate Dodecyl gallate EDTA Erythorbic acid Ferulic acid Grape (<i>Vitis vinifera</i>) seed extract Green tea extract HEDTA Hydroquinone Hydroquinone-beta-D-glucopyranoside p-Hydroxyanisole Lactoferrin Lysine PCA Melanin Methyl gallate Niacinamide ascorbate Nordihydroguaiaric acid Oat (<i>Avena sativa</i>) extract Oryzanol Pentapentapentate Pentonic acid Propyl gallate Retinyl palmitate polypeptide Rosemary (<i>Rosmarinus officinalis</i>) extract Saccharomyces lysate extract Sage (<i>Salvia officinalis</i>) extract Sodium ascorbate, S. erythorbate Sodium metabisulfite Sodium selenate, S. sulfite Superoxide dismutase Tea (<i>Camellia sinensis</i>) extract Tetrasodium EDTA Tocopherol</p>
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Cosmetic Bench Reference 1996

## Functions

Tocopheryl acetate, T. linoleate  
Wild marjoram (*Origanum vulgare*) extract  
Yeast (*Saccharomyces cerevisiae*) extract (Faex)

**Antiperspirant**

Allantoin-aluminum chlorhydrate  
Aluminum capryloyl hydrolyzed collagen  
Aluminum chlorohydrate-gly, A. chloride  
Aluminum chlorohydrate, A. chlorohydrate  
Aluminum PCA, A. sesquichlorohydrate  
Aluminum undecylenoyl collagen amino acids  
Aluminum zirconium pentachlorohydrate  
Aluminum zirconium tetrachlorohydrate  
Aluminum zirconium tetrachlorohydrate GLY  
Aluminum zirconium trichlorohydrate  
Aluminum-zirconium-glycine powder  
Sage (*Salvia officinalis*) extract  
Tormentil (*Potentilla erecta*) extract  
Zirconium chlorohydrate

**Antiseptic**

Aluminum PCA  
Azadirachta indica extract  
2-Bromo-2-nitropropane-1,3-diol  
Calendula amurensis extract  
p-Chloro-m-cresol  
Clove (*Eugenia caryophyllus*) oil  
Crataegus cuneata extract  
Dichlorobenzyl alcohol  
Etiada phaseoloides extract  
Eucalyptus (*Eucalyptus globulus*) extract  
Golden seal (*Hydrastis canadensis*) root extract  
Hexachlorophene  
Melia australasica, M. azadirachta extract  
Methyl salicylate  
Orange (*Citrus aurantium dulcis*) peel extract  
Oxyquinoline sulfate  
Puffball paniculata extract  
Potassium abietoyl hydrolyzed collagen  
PVP-iodine  
Silver nitrate  
Sodium salicylate  
Sterculia plataniifolia extract  
Tea tree (*Melaleuca alternifolia*) oil  
Tormentil (*Potentilla erecta*) extract  
Xanthoxylum bunganum extract

**Antistat**

Acetamide MEA  
Acetamidopropyl trimonium chloride  
6-(N-Acetylamino)-4-oxyhexyltrimonium chloride  
Alkyl dimethyl betaine  
Babassuamidopropylalkonium chloride  
Behenamidopropyl ethyldimonium ethosulfate  
Behenamidopropyl hydroxyethyl dimonium chloride  
Carboxymethyl chitin  
Cetyltrimethyl ammonium ethosulfate  
Cetrimonium chloride  
Chitin  
Chitosan  
Cocamidopropyl ethyldimonium ethosulfate  
Cocodimonium hydroxypropyl hydrolyzed rice protein  
Cocodimonium hydroxypropyl hydrolyzed soy protein  
Dimethicone hydroxypropyl trimonium chloride  
Dimethyl behenamine, D. cocamine  
Dimethyl palmistamine, D. soyamine  
Dimethyl tallowamine  
Dioleylamidodihydroxyethylmonium methosulfate  
Dipalmitoyl ethyl hydroxyethylmonium methosulfate  
N-Dodecyl-N,N-dimethyl-N-(dodecyl acetate) ammonium chloride  
Erucamidopropyl hydroxyvalinate  
Glycerol monoperfluoroglutarate  
Hydrogenated tallowamine oxide  
Isostearamidopropyl dimethylamine

Lactamidopropyl trimonium chloride  
Lauryldimonium hydroxypropyl hydrolyzed collagen  
Linoleamidopropyl dimethylamine dimer diinoleate  
Olealkonium chloride  
PEG-2 cocamine  
PEG-2 cocomonium chloride  
PEG-2 oleammonium chloride  
PEG-8 caprylic/capric glycerides  
PEG-10 cocamine  
PEG-15 soyamine  
PPG-9 diethylmonium chloride  
PPG-25 diethylmonium chloride  
PPG-40 diethylmonium chloride  
Propylene glycol stearate  
Quaternium-26, -27, -53, -62, -72  
Rapeseedamidopropyl benzyltrimonium chloride  
Rapeseedamidopropyl epoxypropyl dimonium chloride  
Silica, colloidal  
Sorbitan caprylate  
N-Soy-(3-amidopropyl)-N,N-dimethyl-N-ethyl ammonium ethyl sulfate  
Soyethyl morpholinium ethosulfate  
Soyethyltrimonium ethosulfate  
Stearalkonium chloride  
Stearamidopropyl benzyl dimonium chloride  
Stearamidopropyl ethyldimonium ethosulfate  
Steartrimonium chloride  
N-Stearyl-(3-amidopropyl)-N,N-dimethyl-N-ethyl ammonium ethyl sulfate  
Wheat germamidopropyl ethyldimonium ethosulfate

**Astringent**

Aluminum citrate, A. lactate  
Astragalus sinensis extract  
Astrocaryum murumuru, A. nutans extract  
Azadirachta indica extract  
Azelaamide MEA  
Bearberry (*Arctostaphylos uva-ursi*) extract  
Birch (*Betula alba*) leaf extract  
Catalpa belpiaria extract  
Celastus paniculata extract  
Coccinea indica extract  
Coffee (*Coffea arabica*) bean extract  
Euphrasia officinalis extract  
Euterpe precatoria extract  
Evening primrose (*Oenothera biennis*) extract  
Gentian (*Gentiana lutea*) extract  
Geranium maculatum extract  
Grape (*Vitis vinifera*) leaf extract  
Henna (*Lawsonia inermis*) extract  
Hieracium odorata extract  
Honeysuckle (*Lonicera caprifolium*) extract  
Hops (*Humulus lupulus*) extract  
Horsetail extract  
Hypericum perforatum extract  
Ivy extract  
Juniperus communis extract  
Kadsura heteriloca extract  
Kola (*Cola acuminata*) extract  
Lady's mantle (*Alchemilla vulgaris*) extract  
Lemon (*Citrus medica limonum*) extract, peel extract  
Lemon bioflavonoids extract  
Lysimachia foenum-graecum extract  
Magnolia spp. extract  
Mauritia flexosa extract  
Maximiliana regia extract  
Melaleuca uncinata, M. wilsonii extract  
Melia australasica extract  
Nettle (*Urtica dioica*) extract  
Oak (*Quercus*) bark extract  
Ocimum basilicum, O. sanctum extract  
Palmetto extract  
Passion flower (*Passiflora laurifolia*) fruit extract  
Plantain (*Plantago major*) extract  
Polygoum multiflorum extract  
Pterocarpus marsupianus extract  
Raspberry (*Rubus*) extract

Sambucus nigra oil  
Sanguisorba root extract  
Selinum spp. extract  
Siboria robusta extract  
Tannic acid  
Walnut (*Juglans regia*) leaf extract, oil  
Wheat (*Triticum vulgare*) protein  
White helle (*Lamium album*) extract  
Witch hazel (*Hamamelis virginiana*) extract  
Xanthoxylum bunganum extract  
Zinc lactate  
Ziziphus jujuba extract

**Binder**

Aluminum starch octenylsuccinate  
Boron amide  
C20-40, C30-50, C40-60 alcohols  
Calcium stearate  
Cellulose gum  
Dihydroabietyl behenate  
Diisostearyl malate  
Diocetyl sebacate  
Distarch phosphate  
Ethylcellulose  
Gellan gum  
Hydrogenated jojoba oil  
Isocetyl alcohol, I. palmitate  
Isopropyl isostearate  
Isostearyl erucate, I. isostearate  
Isostearyl seopentanoate  
Maltodextrin  
Methylcellulose  
Microcrystalline cellulose  
Octyl palmitate  
Octyldodecyl myristate  
bis-Octyldodecyl stearoyl dimer diinoleate  
Octyldodecyl stearoyl stearate  
Oleyl oleate  
PEG-20, -75, -150, -240, -350  
Polydipentene  
Polyethylene, P., micronized  
PTFE  
PVP  
Sorbitol  
Synthetic wax  
Tapioca dextrin  
Tridecyl behenate, T. neopentanoate  
Tridecyl stearoyl stearate  
Trisodium HEDTA

**Biol. polymer**

Distarch phosphate  
Dog rose (*Rosa canina*) seed extract  
Hydrogen peroxide  
Kojic acid  
Mulberry (*Morus nigra*) extract  
Sanguisorba root extract

**Botanical**

Acacia  
Acacia farnesiana extract  
Agrimony (*Agrimonia eupatoria*) extract  
Alder (*Alnus firma*) extract  
Alfalfa (*Medicago sativa*) extract  
Algae (*Ascomyllum nodosum*) extract  
Algae (*Lithothamnium calcareum*) extract  
Aloe barbadensis, A.b. extract  
Aloe capensis extract  
Alpine Veronica extract  
Althea officinalis extract  
Angelica archangelica extract  
Anise (*Pimpinella anisum*) extract  
Apple (*Pyrus malus*) extract  
Apricot (*Prunus armeniaca*) extract  
Arnica montana extract  
Artemisia capillaris extract  
Anchovy (*Cynara scolymus*) extract  
Asafetida (*Ferula assa foetida*) extract  
Asiaticum scholudii extract

## Functions

Asparagus officinalis extract	Cucumber (Cucumis sativus) extract	Jasmine (Jasminum officinale) extract
Asparagus sinensis extract	Cypress (Cupressus sempervirens) extract	Job's tears (Coix lacryma-jobi) extract
Avena (Oryza nivale) extract	Dandelion (Taraxacum officinale) extract	Jojoba (Buxus chinensis) seed powder
Avocado (Persea graecum) extract	Date (Phoenix dactylifera) extract	Juniperus communis extract
Balm mint (Melissa officinalis) extract, oil extract	Dead Sea Mud, Sulfur	Kelp (Macrocystis pyrifera) extract
Banana (Musa sapientum) extract	Dog rose (Rosa canina) hips extract	Kiwi (Actinidia chinensis) fruit extract, seed oil
Barley (Hordeum vulgare) extract	Dyer's henna extract	Kola (Cola acuminata) extract
Basil (Ocimum basilicum) extract	Eleutheria ginseng (Acanthopanax senticosus) extract	Krameria triandra extract
Bearberry (Arctostaphylos uva-ursi) extract	Elm (Ulmus campestris) extract	Lady's mantle (Alchemilla vulgaris) extract
Bee pollen extract	Eucalyptus (Eucalyptus globulus) extract	Lady's Thistle (Silybum marianum) extract
Beet (Beta vulgaris) extract	Eucalyptus globulus oil	Laurel (Laurus nobilis) extract
Betaglucon	Eucommia ulmoides extract	Lavender (Lavandula angustifolia) extract, water
Bilberry (Vaccinium myrtillus) extract	Euphrasia officinalis extract	Lemon (Citrus medica limonum) extract, juice extract, peel extract
Biotinonoids	Evening primrose (Oenothera biennis) extract, oil	Lemon biotinonoids extract
Birch (Betula alba) bark extract, leaf extract	Everlasting (Helichrysum arenarium) extract	Lemongrass (Cymbopogon schoenanthus) extract
Birch (Betula platyphylla japonica) extract	Fennel (Foeniculum vulgare) extract	Leopard flower (Belamcanda chinensis) root extract
Bitter orange (Citrus aurantium amara) extract, flower extract, peel extract	Fenugreek extract	Leucis (Lactuca scariola sativa) extract
Black cohosh (Cimicifuga racemosa) extract	Fermented rice (Oryza sativa) extract	Licorice (Glycyrrhiza glabra) extract
Black currant (Ribes nigrum) extract	Fern (Dryopteris filix-mas) extract	Lilac (Syringa vulgaris) extract
Black henna extract	Fig (Ficus carica) extract	Linden (Tilia argentea) extract
Black poplar (Populus nigra) extract	Fir needle extract	Linden (Tilia cordata) extract, water
Black walnut (Juglans nigra) extract	Fumitory (Fumaria officinalis) extract	Loquat (Eriobotrya japonica) leaf extract
Bladderwrack (Fucus vesiculosus) extract	Gardenia florida extract	Maidenhair fern extract
Borage (Borago officinalis) extract	Garlic (Allium sativum) extract	Magnolia kobus extract
Buckthorn (Frangula alnus) extract	Gelidium cartilagineum	Mallow extract
Burdock (Arctium lappa) extract	Gentian (Gentiana lutea) extract	Mandragora officinarum extract
Burdock (Arctium minus) root extract	Geranium maculatum extract	Mannan
Burnet extract	Ginger root extract	Mangold
Butcherbroom (Ruscus aculeatus) extract	Ginkgo biloba extract	Marine sils
Cabbage rose (Rosa centifolia) extract	Ginseng (Panax ginseng) extract	Matricaria (Chamomilla recutita) extract
Calamus (Acorus calamus) extract	Glycyrrhetic acid	Meadowsweet (Spiraea ulmaria) extract
Calendula officinalis extract	Glycyrrhizin, ammoniated	Melon (Cucumis melo) extract
Caper (Capparis spinosa) extract	Gulden seal (Hydraxis canadensis) root extract	MEA iodine
Capsicum frutescens extract, C.f. oleoresin	Goldthread (Coptis japonica) extract	Mistletoe (Viscum album) extract
Caraway (Carum carvi) extract	Guni kola extract	Mugwort (Anemopsis princeps) extract, water
Carageenan (Chondrus crispus)	Grape (Vitis vinifera) disillate, extract	Mulberry (Morus alba) root extract
Carrot (Daucus carota) extract	Grape (Vitis vinifera) leaf, seed extract	Mulberry (Morus bombycis) root extract
Carrot (Daucus carota sativa) oil	Grape skin extract	Mushroom extract
Cassia sennula extract	Grapefruit (Citrus grandis) peel extract	Myrrh (Commiphora myrrha) extract
Celandine (Chelidonium majus) extract	Green bean (Phaseolus lunatus) extract	Nasturtium extract
Chamomile (Anthemis nobilis) extract, oil	Ground Ivy (Glechoma hederacea) extract	Neroli extract
Chaparral (Larrea mexicana) extract	Guarana (Paulinia cupana) extract	Nettle (Urtica dioica) extract
Cherry (Prunus speciosa) leaf extract	Harpagophytum procumbens extract	Oak (Quercus) bark extract
Cherry bark, C.b. extract	Hayflower extract	Oak root extract
Chestnut (Castanea sativa) extract	Hazel (Corylus avellana) nut extract	Oat (Avena sativa) bran, bran extract, flour, protein
Chinese hederis (Hibiscus rosa-sinensis) extract	Henna (Lawsonia inermis) extract	Oat flower
Chlorella vulgaris extract	Hesperidin, H. methyl chalcone	Olive (Olea europaea) extract, leaf extract
Cimicifuga foetida rhizome extract	Hibiscus sabdariffa extract	Onion (Allium cepa) extract
Cinchona succubra extract	Hibiscus syriacus extract	Orange blossom extract
Citroflavonoid, water soluble	High beta-glucan barley flour	Orange (Citrus aurantium dulcis) flower extract, peel extract
Citrus bioflavonoid complex	Honeysuckle (Lonicera caprifolium) extract	Pansy (Viola tricolor) extract
Clary extract	Honeysuckle (Lonicera japonica) leaf extract	Papaya (Carica papaya) extract
Clove (Eugenia caryophyllus) extract	Hops (Humulus lupulus) extract	Parsley (Carum petroselinum) extract
Clover (Trifolium pratense) extract	Horse chestnut (Aesculus hippocastanum) extract	Passion flower (Passiflora laurifolia) fruit extract
Cnidium officinale rhizome extract, C.O. water	Horseradish (Cochlearia armoracia) extract	Passionflower (Passiflora incarnata) extract
Coffee (Coffea arabica) bean extract	Horsetail extract	Pea (Pisum sativum) extract
Colloidal oatmeal	Houttuynia cordata extract	Peach (Prunus persica) extract, leaf extract
Coltsfoot (Tussilago farfara) leaf extract	Hyacinth (Hyacinthus orientalis) extract	Pelargonium capitatum extract
Comfrey (Symphytum officinale) leaf extract	Hydrocotyl (Centella asiatica) extract	Pellitory (Plantago officinalis) extract
Condurango extract	Hydrolyzed oat protein, soy flour	Pennyroyal (Mentha pulegium) extract
Coneflower (Echinacea angustifolia) extract	Hypericum perforatum extract	Peony (Paeonia alba) extract
Carallina officinalis	Hyssop (Hyssopus officinalis) extract	Peony (Paeonia obovata) root extract
Corchorus olivaceus extract	Indian cress (Tropaeolum majus) extract	Peppermint (Mentha piperita) extract, oil
Coriander (Coriandrum sativum) extract	Isoodon japonicus extract	Perilla ocyroides extract
Corn (Zea mays) cob powder, silk extract	Ivy extract	Periwinkle (Vinca minor) extract
Corn poppy (Papaver rhoeas) extract	Japanese angelica (Angelica acutiloba) extract, water	PEG-80 jojoba acid/alcohol
Cornflower (Centaurea cyanus) extract	Japanese hawthorn (Crataegus cuneata) extract	PEG-120 jojoba acid/alcohol
Couch (Agropyron repens) grass		
Crataegus monogyna extract		
Cnidium munitum extract		

## CAMPO Siddha Herbs Extracts

Jothi-Pul (Glow-grass) Siddha Extract for High content bio-available  
 Natural Radium for anti Kaposi Sarcoma Skin Treatment.  
 Roma-Maram (Hairy Tree) Siddha Extract for ANTI-SENSE DNA  
 Topical applications for HIV+ Lymph-nodes  
 Siddha Extracts for post-Chemotherapy Skin-Damage Treatment



## CAMPO RESEARCH

Level 36, Hong Leong Building,  
 16 Raffles Quay, Singapore 0104

Tel: (65) - 7653292 Full Colour Fax: (65) - 7653293

PC - Video Teleconferencing (65) 7653292 - For Tech. Assistance.



## Functions

*Pistia paniculata* extract  
*Phellodendron amurense* extract  
 Phospholipids  
*Pimenta* (*Pimenta officinalis*) extract  
 Pine (*Pinus sylvestris*) conc. needle extract  
 Pineapple (*Ananas sativus*) extract  
 Plantain (*Plantago major*) extract  
 Pollen extract  
 Pongamol  
*Poria Cocos* extract  
*Pueraria lobata* extract  
 Queen of the meadow extract  
*Quillaja saponaria* extract  
 Quince (*Pyrus cydonia*) seed extract  
 Quinoa (*Chenopodium quinoa*) extract  
 Raspberry (*Rubus*) extract  
*Rauwolfia* (*Serpentina*) extract  
 Red clover  
*Rehmannia chinensis* extract  
 Restharrow (*Ononis spinosa*) extract  
*Rhododendron chrysanthum* extract  
*Rhodophyceae* extract  
 Rhubarb (*Rheum palmatum*) extract  
 Rice (*Oryza sativa*) bran extract  
 Rice fatty acid  
 Rose (*Rosa multiflora*) extract  
 Rosemary (*Rosmarinus officinalis*) extract  
*Rubia tinctorum* extract  
 Safflower (*Carthamus tinctorius*) extract  
 Sage (*Salvia officinalis*) extract, water  
*Sambucus nigra* berry extract, extract  
 Sandalwood (*Santalum album*) extract  
*Sanguinaria canadensis* extract  
*Saponaria officinalis* extract  
*Sasa veitchii* extract  
*Saxifraga sarmentosa* extract  
*Scabiosa arvensis* extract  
*Scutellaria baicatusensis* root extract  
 Silk extract  
 Silver fir (*Abies pectinata*) extract  
 Sisal (*Agave rigida*) extract  
 Slippery elm extract  
 Soapberry (*Sapindus mukurossi*) extract  
*Sophora angustifolia* extract  
*Sophora flavescens* root extract  
*Sophora japonica* extract  
 Soybean (*Glycine soja*) extract  
 Soy (*Glycine soja*) germ extract, protein, sterol  
 Spearmint (*Mentha viridis*) extract, oil  
 Spinach (*Spinacia oleracea*) extract  
*Spiraea ulmaria* extract  
 Sunflower (*Helianthus annuus*) seed extract  
 Sweet almond (*Prunus amygdalus dulcis*) extract  
 Sweet cherry (*Prunus avium*) extract  
 Sweet cicely (*Anthriscus cerefolium*) extract  
 Sweet clover (*Melilotus officinalis*) extract  
 Sweet violet (*Viola odorata*) extract  
*Sweeneya chirata* extract  
 Tea (*Camellia sinensis*) extract  
 Thistle (*Chicus benedictus*) extract  
 Thyme (*Thymus vulgaris*) extract  
 Tomato (*Solanum lycopersicum*) extract  
 Tormentil (*Potentilla erecta*) extract  
 Tuberosa (*Polygonum tuberosa*) extract  
 Turmeric (*Curcuma longa*) extract  
 Valerian (*Valeriana officinalis*) extract  
 Walnut (*Juglans regia*) extract, leaf extract  
 Water Lily (*Nymphaea alba*) root extract  
 Watercress (*Nasturtium officinale*) extract

Wheat (*Triticum vulgare*) extract, protein  
 Wheat (*Triticum vulgare*) germ extract  
 Wheat bran lipids  
 White ginger (*Hedychium coronarium*) extract  
 White nerle (*Lamium album*) extract  
 Wild agrimony (*Potentilla anserina*) extract  
 Wild cherry (*Prunus serotina*) bark extract  
 Wild indigo (*Baptista tinctoria*)  
 Wild marjoram (*Origanum vulgare*) extract  
 Willow (*Salix alba*) bark extract, extract  
 Willow (*Salix alba*) leaf extract  
 Witch hazel (*Hamamelis virginiana*) extract  
 Yarrow (*Achillea millefolium*) extract  
 Yeast (*Saccharomyces cerevisiae*) extract (Faea)  
 Yucca vera extract  
*Zanthoxylum piperitum* extract  
 Zedoary (*Curcuma zedoaria*) oil

**Buffer**

Ammonium carbonate, A. phosphate  
 Calcium hydroxide, C. phosphate  
 Citric acid  
 Ethanolamine HCl  
 Glycine  
 Phosphoric acid  
 Potassium phosphate  
 Potassium sodium tartrate  
 Sodium acetate, S. citrate  
 Sodium lactate, S. phosphate  
 Succinic acid  
 Tromethamine

**Carrier**

Acrylates copolymer, spherical powder  
 Arginine  
 Caprylic/capric triglyceride  
 Caprylic/capric/lauric triglyceride  
 Caprylic/capric/linoleic triglyceride  
 Caprylic/capric/oleic triglycerides  
 Ceteareth-20  
 Coconut (*Cocos nucifera*) oil  
 Cyclodextrin  
 Dipropylene glycol  
 Glyceryl caprylate, G. caprylate/caprate  
 Hydrated silica  
 Liposomes  
 Magnesium silicate  
 Methyl propanediol  
 PEG-8/SMDI copolymer  
 Potassium chloride  
 PPG-12/SMDI Copolymer  
 PPG-31/SMDI Copolymer  
 Propylene carbonate, P. glycol  
 Serum albumin  
 Sodium carboxymethyl beta-glucan  
 Sodium chloride  
 Sodium magnesium silicate  
 Tapioca dextrin

**Chelators**

beta-Alanine diacetic acid  
 Calcium disodium EDTA  
 Disodium EDTA, -copper  
 EDTA  
 HEDTA  
 Malic acid  
 Monosaccharyl citrate  
 Pentasodium pentetate  
 Pentetic acid

Phytic acid  
 Potassium aspartate  
 Sodium aspartate  
 Sodium dihydroxyethylglycinate  
 Sodium hexametaphosphate  
 Tetrahydroxypropyl ethylenediamine  
 Tetrasodium EDTA  
 Tripotassium EDTA  
 Trisodium EDTA, HEDTA

**Cell stimulant**

*Aesculus chinensis* extract  
*Anemisia apiacea* extract  
*Astrocaryum muru. A. nucuma* extract  
*Baccharis gasipaes* extract  
*Borago sorbilla* extract  
*Calendula arvensis* extract  
*Chrysanthemum morifolium* extract  
*Coccinea indica* extract  
 Comfrey (*Symphytum officinale*) leaf extract  
 Condurango extract  
 Dandelion (*Taraxacum officinale*) extract  
*Echium glaucum* extract  
*Equisetum arvense* extract  
 Eucalyptus (*Eucalyptus globulus*) extract  
*Eupatorium fortunei* extract  
*Euterpe precatoria* extract  
*Ficus racemosa* extract  
 Glycoproteins  
*Hierochloa odorata* extract  
 Horse chestnut (*Aesculus hippocastanum*) extract  
*Inga edulis* extract  
*Kadsura heteroloba* extract  
*Ligustrum lucidum* extract  
*Lysimachia foenum-graecum* extract  
*Mauritia flexosa* extract  
*Maximiliana regia* extract  
*Metaleuca bracteata. M. symphyocarp* extract  
*Nelumbium speciosum* extract  
*Ocimum basilicum* extract, O. santum extract  
*Paulownia imperialis* extract  
*Pistia spp.* extract  
*Pterocarpus marsupianus* extract  
*Rubus thunbergii* extract  
*Selinum spp.* extract  
*Shorea robusta* extract  
*Zanthoxylum bungeanum* extract

**Cleansing**

Birch (*Betula alba*) leaf extract  
 Lemongrass (*Cymbopogon schoenanthus*) extract  
 Oat (*Avena sativa*) bran extract  
 Passion flower (*Passiflora laurifolia*) fruit extract  
 Witch hazel (*Hamamelis virginiana*) extract  
 Yarrow (*Achillea millefolium*) extract

**Conditioner**

Acetamide MEA  
 6-(N-Acetylamino)-L-xylohexyltrimonium chloride  
 Acrylamidopropyltrimonium chloride/acrylamide  
 copolymer  
 Adipic acid/dimethylaminohydroxypropyl  
 diethylene triamine copolymer  
 AMP-isostearyl hydrolyzed wheat protein  
 Apricot (*Prunus armeniaca*) kernel oil  
 Behenalkonium chloride  
 Behenamidopropyl dihydroxypropyl dimonium  
 chloride  
 Behenamidopropyl ethyldimonium ethosulfate  
 Behenamidopropyl PG-dimonium chloride

CAMPO Siddha Herb Extracts  
 CAMPO Rainforest Herb Extracts & Oils  
 CAMPO Australasian Herbs & Tea Tree Extracts  
 CAMPO Chinese & Japanese Herb Extracts

 CAMPO RESEARCH   
 Level 36, Hong Leong Building,  
 16 Raffles Quay, Singapore 0104  
 Tel: (65) - 7653292 Full Colour Fax: (65) - 7653293  
 PC - Video Teleconferencing (65) 7653292 - For Tech. Assistance.

Cosmetic Bench Reference 1996



## Functions

Behenamidopropyl dimethylamine behenate	Hydrolyzed sweet almond protein	Polymethacrylamidopropyltrimonium chloride
Behenamine oxide	Hydrolyzed wheat protein/PVP copolymer	Polyoxyethylene dihydroxypropyl linoleaminium chloride
Behenyl PG-trimonium chloride	Hydrolyzed wheat protein polysiloxane polymer	Polyquaternium-2, -5, -6, -11, -16
Behenyl betaine	Hydroxycetyl hydroxyethyl dimonium chloride	Polyquaternium-17, -18, -24, -29, -44
Benzyltrimonium hydrolyzed collagen	Hydroxyproline	Potassium dimethicone copolyol panthenyl phosphate
Canolamidopropyl betaine	Hydroxypropyl chitosan	Potassium lauroyl collagen amino acids
Capramide DEA	Hydroxypropyl guar hydroxypropyltrimonium chloride	Potassium lauroyl hydrolyzed soy protein
Caprylic/capric/lauric triglyceride	Hydroxypropyl-bis-isostearylamidopropylidimonium chloride	Potassium lauroyl wheat amino acids
Caprylyl pyrrolidone	Hydroxypropyl bis-stearyldimonium chloride	Potassium stearyl hydrolyzed collagen
Cassia auriculata extract	Hydroxypropyltrimonium gelatin	PPG-5 lanolin alcohol ether
Cetamine oxide	Hydroxypropyltrimonium hydrolyzed keratin	PPG-9 diethylmonium chloride
Cetearalkonium chloride	H.h. silk	PPG-20 lanolin alcohol ether
Chitosan PCA	Hydroxypropyltrimonium hydrolyzed wheat protein	Prolife
Citric acid	Isopropyl hydroxybutyramide dimethicone copolyol	Propylene glycol stearate
Cocamidopropyl dimethylamine, C.d. lactate, C.d. propionate	Isopropyl lanolate	PVP/dimethiconylacrylate/polycarbonyl/polyglycol ester
Cocamidopropyl dimethylaminohydroxypropyl hydrolyzed collagen	Isostearamidopropyl betaine, L. dimethylamine	PVP/dimethylaminoethylmethacrylate copolymer
Cocamidopropylidimonium	Isostearamidopropyl dimethylamine gluconate	PVP/dimethylaminoethylmethacrylate/polycarbonyl/polyglycol ester
hydroxypropylhydrolyzed collagen	Isostearamidopropyl dimethylamine glycolate	PVP/hydrolyzed wheat protein copolymer
Cocamidopropyl ethyldimonium ethosulfate	Isostearamidopropyl dimethylamine lactate	Quaternium-22, -26, -33, -61, -62, -70, -80
Cocamidopropyl PG-dimonium chloride, C.P.C. phosphate	Isostearamidopropyl ethyldimonium ethosulfate	Quaternium-76 hydrolyzed collagen
Coco-morpholine oxide	Isostearamidopropyl laurylacetodimonium chloride	Rapeseedamidopropyl benzylidimonium chloride
Cocoleamidopropyl betaine	Isostearamidopropyl morpholine oxide	Rapeseedamidopropyl epoxypropyl dimonium chloride
Cocodimonium hydroxypropyl hydrolyzed hair keratin	Isostearamidopropyl PG-dimonium chloride	Rapeseedamidopropyl ethyldimonium ethosulfate
Cocodimonium hydroxypropyl hydrolyzed rice protein	Isostearaminopropylalkenium chloride	Rice peptide
Cocodimonium hydroxypropyl hydrolyzed silk	Isostearyl hydrolyzed animal protein	Ricinoleamidopropyl-dimonium ethosulfate
Cocodimonium hydroxypropyl hydrolyzed soy protein	Isostearylamidopropyl dihydroxypropyl dimonium chloride	Ricinoleamidopropyl betaine
Cocoon alcohol	Lactoglobulin	Ricinoleamidopropyl dimethylamine lactate
N-Cocoyl-(3-amidopropyl)-N,N-dimethyl-N-ethyl ammonium ethyl sulfate	Lauramidopropyl dimethylamine	Ricinoleamidopropyl ethyldimonium ethosulfate
Collagen phthalate	Lauramidopropyl PG-dimonium chloride, I.P.C. phosphate	Ricinoleamidopropyltrimonium chloride
Dibehenyl/diarachidyl dimonium chloride	Lauramine oxide	Ricinoleamidopropyltrimonium ethosulfate
Dibehenylidimonium chloride	Laurampho PG-glycinate phosphate	Silicone quaternium-J, -4
Dicetyl dimonium chloride	Lauryl hydrolyzed collagen, L.h. elastin	Silk amino acids
Didecylidimonium chloride	Lauryl silk amino acids	Sodium/TEA-lauryl collagen amino acids
Dihydroxyethyl cocamine oxide	Lauryl methyl gluceth-10 hydroxypropyl-dimonium chloride	Sodium/TEA-lauryl hydrolyzed keratin
Dihydroxyethyl dihydroxypropyl stearamonium chloride	Lauryl phosphate, L. pyrrolidone	Sodium/TEA-lauryl keratin amino acids
Dihydroxyethyl tallow glycinate	Laurylidimonium hydroxypropyl hydrolyzed collagen, keratin, soy protein	Sodium citrate
Dihydroxyethyl tallowamine oxide	Linoleamidopropyl dimethylamine	Sodium cocoyl hydrolyzed soy protein
Dilauryl acetyl dimonium chloride	Milk amino acids	Sodium hydrogenated tallow dimethyl glycinate
Diloleamidopropyl dimethylamine	Milk protein (Lactis proteinum)	Sodium lauroyl collagen, keratin amino acids
Dimethyl hydrogenated tallowamine	Myristalkonium chloride	Sodium lauroyl wheat amino acids
Dimethyl lauramine, D.I. isostearate	Myristamidopropyl betaine, M. dimethylamine	Sodium stearamphosphate
Dimethyl myristamine, soyamine, stearamine	Myristonium bromide	Soluble keratin, wheat protein
Dimethylamidopropylamine dimerate	Oat (Avena sativa) protein	Soyamide DEA
Disodium hydrogenated cottonseed glyceride sulfosuccinate	Oleamide	Soyamidopropyl benzylidimonium chloride
Disodium laureth sulfosuccinate	Oleamidopropyl betaine, O. dimethylamine	Soyamidopropyl betaine, S. dimethylamine
Disodium lauroamphodiacetate	Oleamidopropyl dimethylamine hydrolyzed collagen	Soyamidopropyl ethyldimonium ethosulfate
Disocetyl dimonium chloride	Oleamidopropylamine oxide	Soyethyl morpholinium ethosulfate
Ethyl ester of hydrolyzed keratin	Oleamine	Soyethylidimonium ethosulfate
N-Ethylether-bis-1,4-N-isostearylamidopropyl-N,N-dimethyl ammonium chlo	Oleamine oxide	Stearamide MEA
Glutamic acid	Oleoyl sarcosine	Stearamidodethyl diethylamine, ethanolamine
Glycerol collagenate	Oleyl betaine	Stearamidopropyl benzyl dimonium chloride
Glycine	Oleyl dimethylamidopropyl ethonium ethosulfate	Stearamidopropyl ceteryl dimonium tosylate
Guar hydroxypropyltrimonium chloride	Palmitamidopropyl betaine	Stearamidopropyl dimethylamine stearate
Heena (Lawsonia inermis) extract	Palmitamidopropyl dimethylamine	Stearamidopropyl ethyldimonium ethosulfate
Hydrogenated tallowamine oxide	Palmitamine, P. oxide	Stearamidopropyl morpholine lactate
Hydrogenated tallowtrimonium chloride	Panthenyl hydroxypropyl steardimonium chloride	Stearamidopropyl PG-dimonium chloride
Hydrolyzed concision protein	PEG-2 milk solids	phosphate
Hydrolyzed egg protein	PEG-2 oleaminium chloride	Stearamine oxide
Hydrolyzed elastin	PEG-3 lauramine oxide	Steardimonium hydroxypropyl hydrolyzed collagen, keratin
Hydrolyzed fibronectin	PEG-5 stearyl ammonium lactate	Steardimonium panthenol
Hydrolyzed fish protein	PEG-15 cocomonium chloride	Stearyl amidoethyl diethylamine
Hydrolyzed keratin	PEG-15 cocopolymine	Stearamonium bromide
Hydrolyzed lactalbumin	PEG-15 tallowmonium chloride	Stearyl dimethicone
Hydrolyzed milk protein	PEG-27	Tallowamidopropyl dimethylamine
Hydrolyzed oats	PEG-40	Tetramethyl trihydroxy hexadecane
Hydrolyzed reticulin	PEG-85 lanolin	TEA-cocoyl hydrolyzed collagen
Hydrolyzed soy protein	PEG-7000	Trachea hydrolyzate
	Polydimethicone copolyol	Tricetyltrimonium chloride
		Tridecyl salicylate
		Tricetium hydrolyzed collagen ethosulfate
		Wheat germamidopropylalkonium chloride
		Wheat germamidopropyl dimethylamine lactate

## Functions

Wheat germamidopropyl ethyldimonium  
ethosulfate  
Wheat peptide  
Yeast powder, deproteinized  
**Coupling agent**  
Acetyl monoethanolamine  
Buryloctanol  
Myreth-3  
Oleyl alcohol  
PPG-10 butanediol  
PPG-10 cetyl ether  
PPG-10 oleyl ether  
PPG-15 stearyl ether  
PPG-22 butyl ether  
PPG-23 oleyl ether  
PPG-50 oleyl ether  
Trideceth-7 carboxylic acid  
**Denaturant**  
Brucine sulfate  
Denatonium benzoate, saccharide  
Nicotine sulfate  
Sucrose octaacetate  
Thymol  
**Dental powder**  
Dicalcium phosphate  
Silica  
Sodium monofluorophosphate  
Stannous fluoride  
**Deodorant**  
Abietic acid  
Azadirachta indica extract  
Chlorophyllin-copper complex  
Eugenia jambolana extract  
Farnesol  
Fermented vegetable  
Mauritia flexosa extract  
Salvia miltiorrhiza extract  
Sodium aluminum chlorohydroxy lactate  
Spondias amara extract  
Triethyl citrate  
Zinc phenol sulfonate, Z. ricinoleate  
**Depilatory**  
Barium sulfide  
Beeswax, oxidized  
Calcium thioglycolate  
L-cysteine HCL  
Potassium thioglycolate  
Sodium thioglycolate  
Thioglycerin  
**Detergent**  
Ammonium laureth sulfate  
Ammonium lauryl sulfate  
Capramide DEA  
Cocamidopropyl dimethylamine lactate  
Decyl glucoside  
Decyltetradeceth-25  
DEA lauryl sulfate  
Diamyl sodium sulfosuccinate  
Dicyclohexyl sodium sulfosuccinate  
Diisobutyl sodium sulfosuccinate  
Disodium caproamphodipropionate  
Disodium caproamphodipropionate  
Disodium caprylamphodipropionate  
Disodium cetearyl sulfosuccinate  
Disodium cocamido MEA-sulfosuccinate  
Disodium cocamido MIPA-sulfosuccinate  
Disodium cocoamphodipropionate  
Disodium deceth-6 sulfosuccinate  
Disodium isodecyl sulfosuccinate  
Disodium lauramido MEA-sulfosuccinate  
Disodium lauramido PEG-2 sulfosuccinate  
Disodium laureth sulfosuccinate

Disodium lauroamphodipropionate  
Disodium lauroamphodipropionate  
Disodium lauryl sulfosuccinate  
Disodium myristamido MEA-sulfosuccinate  
Disodium oocoxynol-10 sulfosuccinate  
Disodium oleamido PEG-2 sulfosuccinate  
Disodium PEG-4 cocamido MIPA-sulfosuccinate  
Disodium ricinoleamido MEA-sulfosuccinate  
Disodium tallowiminodipropionate  
Dodecylbenzene sulfonic acid  
Dodecynol-6, -9  
Isopropylamine dodecylbenzenesulfonate  
Isostearamidopropyl betaine  
Isosteareth-6 carboxylic acid  
Isostearamphodipropionate  
Isostearyl hydroxyethyl imidazoline  
Lauramidopropylamine oxide  
Laureth-11  
Laurampho PG-glycinate phosphate  
Lauryl glucoside, L. phosphate  
Magnesium laureth sulfate, M. lauryl sulfate  
Magnesium PEG-3 cocamide sulfate  
MEA-dodecylbenzenesulfonate  
MEA-laureth sulfate  
MEA-lauryl sulfate  
MIPA-lauryl sulfate  
Myristamine oxide  
Myristic acid  
Nonoxynol-10  
Oleoamphohydroxypropylsulfonate  
Oleth-12, -15  
Oleyl betaine  
Palmitamidopropyl betaine  
PEG-10 glyceryl stearate  
PEG-15 glyceryl stearate  
PEG-25 glyceryl isostearate  
Potassium cocoyl hydrolyzed collagen  
Sodium caproamphosulfate  
Sodium cocoamphosulfate  
Sodium cocoamphopropionate  
Sodium cocomonoglyceride sulfate  
Sodium cocoyl hydrolyzed soy protein  
Sodium cocoyl isethionate  
Sodium C12-15 parath-25 sulfate  
Sodium C14-16 olefin sulfonate  
Sodium C14-17 alkyl seculfonate  
Sodium deceth sulfate  
Sodium decyl diphenyl ether sulfonate  
Sodium dodecylbenzenesulfonate  
Sodium dodecylidiphenyl ether sulfonate  
Sodium iodate  
Sodium laureth-2 sulfate  
Sodium laureth-3 sulfate  
Sodium laureth-7 sulfate  
Sodium laureth-12 sulfate  
Sodium laureth-13-carboxylate  
Sodium laureth sulfate  
Sodium lauraminodipropionate  
Sodium lauroamphopropionate  
Sodium lauroyl methyl alaninate  
Sodium lauryl phosphate, S.I. sulfate  
Sodium lauryl sulfosuccinate  
Sodium methyl oleoyl laurate  
Sodium methyl cocoyl taurate  
Sodium methyl lauroyl laurate  
Sodium methylisophthalenesulfonate  
Sodium myreth sulfate  
Sodium myristyl sulfate  
Sodium oeryl sulfate, oleyl sulfate  
Sodium POE alkyl ether acetate  
Sodium trideceth-7 carboxylate  
Sodium trideceth sulfate  
Sodium tridecyl sulfate  
Stearth-11, -30  
TEA-dodecylbenzenesulfonate  
TEA-laureth sulfate  
TEA-lauryl sulfate  
TEA-palmo kernel sarcosinate

TEA-PEG-3 cocamide sulfate  
Undecylamidopropyl betaine

**Disinfectant**

Benzalkonium chloride  
Chlorophene  
Didecylmonium chloride  
Myristalkonium saccharinate  
Shikonia  
Sodium caprylamphosulfate  
Tea tree (Melaleuca alternifolia) oil  
p-Tertiaryphenol

**Dispersant**

Alkylated polyvinylpyrrolidone  
C10-40, C10-50, C40-60 alcohols  
Castor (Ricinus communis) oil  
Ceteareth-20  
Cetyl PPG-2 isodeceth-7 carboxylate  
Cholesteryl/behanyl/ocetyldecyl lauroyl glutamate  
Decaglycerol monodiolate  
Diisocetyl dodecanedioate  
Diisostearyl adipate  
Dimethicone copolyol methyl ether  
Dioctyldodecyl dimer diisolate  
Dioctyldodecyl dodecanedioate  
Ethyl hydroxymethyl oleyl oxazoline  
Glyceryl caprylate, G. caprylate/caprate  
Glyceryl diisostearate  
Hydrogenated castor oil, H. lecithin  
Hydrogenated tallow glycerides  
Isobutylene/MA copolymer  
Isocetyl alcohol  
Isopropyl C12-15-parath-9-carboxylate  
Isostearyl neopentanoate  
Lanolin acid  
Laureth-4, -6, -16  
Melanin  
Nonoxynol-2, -18, -20, -30, -40  
Octoxynol-5, -10  
Octoxynol 16, 30, 40, 70  
Ocetyldeceth-5  
Ocetyldecyl/dimethicone copolyol citrate  
Oleth-40  
Oleyl alcohol  
PEG-5 castor oil, glyceryl sesquiolate  
PEG-6 beeswax  
PEG-8/SMDI copolymer  
PEG-9 castor oil, oleate, stearate  
PEG-10 dioleate, stearamine  
PEG-12 beeswax  
PEG-12 glyceryl dioleate, laurate  
PEG-15 castor oil  
PEG-20 almond glycerides  
PEG-20 glyceryl isostearate  
PEG-20 sorbitan trisostearate  
PEG-25 castor oil  
PEG-30 dipolyhydroxystearate  
PEG-40 hydrogenated castor oil PCA isostearate  
PEG-60 shea butter glycerides  
Poloxamer 101, 122, 181, 182, 184  
Polyglyceryl-2 sesquiosostearate  
Polyglyceryl-3 diisostearate, oleate  
Polyglyceryl-5 distearate  
Polyglyceryl-6 mixed fatty acids  
Polyglyceryl-10 diisostearate, distearate  
Polyglyceryl-10 decaloleate  
Polyhydroxystearic acid  
Polysorbate 40, 80  
Potassium polyacrylate  
PPG-3 PEG-6 oleyl ether  
PPG-9 diethylmonium phosphate  
PPG-12/SMDI Copolymer  
PPG-15 stearyl ether  
PPG-25, PPG-40 diethylmonium chloride  
PPG-51/SMDI Copolymer  
PVP/eicosene copolymer  
PVP/hexadecene copolymer

## Functions

Rapeseed oil, ethoxylated high erucic acid  
 Ricinoleyl alcohol  
 Sodium cetera-13-carboxylate  
 Sodium lignisulfinate, S. polymethacrylate  
 Sodium polyphthalenesulfonate  
 Sorbitan oleate  
 Steareth-10  
 Tricontanyl PVP  
 Trisostearin PEG-6 esters  
 Trioctyldodecyl citrate

**Emollient**

Acetylated glycol stearate  
 Acetylated hydrogenated lanolin  
 Acetylated hydrogenated lard glyceride  
 Acetylated hydrogenated vegetable glyceride  
 Acetylated lanolin, A.I. alcohol  
 Acetylated lard glyceride  
 Acetylated monoglycerides  
 Acetylated palm kernel glycerides  
 Aleurites moluccana ethyl ester  
 Allantoin  
 Aluminummagnesium hydroxide stearate  
 AMP-isostearyl hydrolyzed soy protein  
 Apricot (Prunus armeniaca) kernel oil  
 Arachidyl benenate  
 Argania spinosa oil  
 Avocado (Persea gratissima) oil, unsaponifiables  
 Avocado oil ethyl ester  
 Babassu (Orbignya oleifera) oil  
 Baryl isostearate, B. stearate  
 Behenamidopropyl dihydroxypropyl dimonium chloride  
 Behenoxy dimethicone  
 Behenyl alcohol, B. benenate  
 Behenyl erucate, B. isosteareate  
 Benzyl laurate  
 Bladderwrack (Fucus vesiculosus) extract  
 Borage (Boragin officinalis) seed oil  
 Borageamidopropyl phosphatidyl PG-dimonium chloride  
 Brain extract  
 Brazil nut (Bertholletia excelsa) oil  
 Butyl myristate, oleate, stearate  
 Butyloctanol  
 Butyloctyl oleate  
 C12-13, C12-16, C14-15 alcohols  
 C12-15 alcohols octanoate  
 C12-15 alkyl benzoate  
 di-C12-15 alkyl fumarate  
 C12-15 alkyl lactate  
 Camellia kissai oil  
 Tea (Camellia sinensis) oil  
 C10-30 cholesterol/stanoic esters  
 Canola oil  
 Caprylic/capric triglyceride  
 Caprylic/capric triglyceride PEG-4 esters  
 Caprylic/capric/lauric triglyceride  
 Caprylic/capric/linoleic triglyceride  
 Caprylic/capric/oleic triglycerides  
 Caprylic/capric/stearic triglyceride  
 Caprylic/capric/succinic triglyceride  
 Capsicum frutescens oleoresin  
 Carrot (Daucus carota sativa) oil  
 Cashew (Anacardium occidentale) nut oil  
 Castor (Ricinus communis) oil  
 Cetearyl benenate, C. candelillate  
 Cetearyl isononanoate, C. octanoate  
 Cetearyl palmitate, C. stearate  
 Ceteth-10  
 Cetoctearyl stearate  
 Cetyl C12-15 paretin-9 carboxylate  
 Cetyl acetate, C. alcohol  
 Cetyl esters, C. lactate  
 Cetyl myristate, C. octanoate  
 Cetyl oleate, C. palmitate  
 Cetyl PPG-2 isoceteth-7 carboxylate  
 Cetyl ricinoleate, C. stearate

Cetyl stearyl octanoate  
 Chia (Salvia hispanica) oil  
 Cholesterol esters  
 Cholesterol  
 Cholesteryl behenyl/lauryldodecyl lauryl glutamate  
 Cholesteryl hydroxystearate  
 Cholesteryl stearate  
 Choleth-24  
 C 18-70 Isoparaffin  
 C10-18, C12-18 triglycerides  
 C12-15 linear alcohols 2-ethylhexanoate  
 Cocamidopropyl PG-dimonium chloride  
 Cocoa (Theobroma cacao) butter  
 Coco-caprylate/caprate  
 Coco-rapeseedate  
 Coconut (Cocos nucifera) oil  
 Cucacyl hydrolyzed soy protein  
 Collagen phthalate  
 Collidal oatmeal  
 Comfrey (Symphytum officinale) leaf extract  
 Corn (Zea mays) oil  
 Corn poppy (Papaver rhoeas) extract  
 Cottonseed (Gossypium) oil  
 Cuttlefish extract  
 Cyclomethicone  
 Deceth-4 phosphate  
 Decyl oleate  
 Decyltetradecanol  
 Dialkyl dimethylpolysiloxane  
 Dibutyl sebacate  
 Dicapryl adipate  
 Dicaprylyl ether, D. maleate  
 Diethylene glycol diisnonanoate  
 Diethylene glycol dioctanoate  
 bis-Diglyceryl/caprylate/caprate/isosteareate  
 hydmyxystearate/adipate  
 bis-Diglyceryl/caprylate/caprate/isosteareth/  
 stearate/hydroxystearate/adipate

Dihydroabietyl benenate  
 Dihydroxyethyl tallowamine oleate  
 Diisobutyl adipate  
 Diisocetyl adipate, dodecanedioate  
 Diisocetyl adipate  
 Diisopropyl adipate, dimer dilinoleate  
 Diisopropyl sebacate  
 Diisostearyl trimethylolpropane siloxy silicate  
 Diisostearyl adipate  
 Diisostearyl dimer dilinoleate  
 Diisostearyl fumarate, D. maleate  
 Dilinoleic acid  
 Dimethicone  
 Dimethicone copolyol  
 Dimethicone copolyol acetate, D.c. almondate  
 Dimethicone copolyol isosteareate, D.c. lactate  
 Dimethicone copolyol methyl ether  
 Dimethicone copolyol phthalate  
 Dimethicone propylethylenediamine benenate  
 Dimethiconol stearate  
 Dimethyl lauramine oleate  
 Dioctyl adipate  
 Dioctyl dimer dilinoleate  
 Dioctylcyclohexane  
 Dioctyldodecyl dimer dilinoleate  
 Dioctyldodecyl dodecanedioate  
 Dioctyl maleate, D. sebacate, succinate  
 Dipentaerythritol fatty acid ester  
 Dipentaerythryl hexacaprylate/hexacaprate  
 Dipentaerythryl hexahydroxystearate/isosteareate  
 Distearyl dimethylamine dilinoleate  
 Distyryl adipate  
 Dog rose (Rosa canina) hips oil  
 Egg (Ovom) yolk extract  
 Emu (Dromiceus) oil  
 Erucyl erucate  
 Ethyl avocadoate  
 Ethylhexyl isopalmitate

## COSMETIC AND PHARMACEUTICAL INGREDIENTS

CAMPHOR USP

CARBOXYMETHYLCELLULOSE USP

CETINA (CETYL ESTERS &amp; STEARAMIDE DEA)

SPERMWAX® (CETYL ESTERS WAX)

CHOLESTEROL NF

DENATONIUM BENZOATE NF

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ROBANE (SQUALANE NF)

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ROBECO INC.

99 PARK AVENUE • NEW YORK, NY 10016

212-986-6410

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OUR 78<sup>TH</sup> YEAR

## Functions

2-Ethylhexyl isostearate	Isoonyl isononanoate	Ocnyldodecanol
Ethyl linolenate, E. myristate	Isopennyldiol	Ocnyldodecyl behenate, O. benzoate
Ethyl myristate, E. myristate	Isopropyl avocadate	Ocnyldodecyl erucate, O. myristate
Ethyl oleate, E. olive	Isopropyl C12-15-pareth-9-carboxylate	Ocnyldodecyl oleate, O. ricinoleate
Evening primrose ( <i>Oenothera biennis</i> ) extract, oil	Isopropyl isostearate	Ocnyldodecyl stearate
Glycereth-4,5-lactate	Isopropyl lanolate, I. linoleate	bis-Ocnyldodecyl stearoyl dimer diisostearate
Glycereth-5 lactate	Isopropyl myristate, I. palmitate	Ocnyldodecyl stearoyl stearate
Glycereth-7 benzoate	Isopropyl PPG-2-isodeceth-7 carboxylate	Oleamine oxide
Glycereth-7 diisononanoate	Isopropyl stearate	Oleic/palmitoleic/linoleic glycerides
Glycereth-7 triacetate	Isosorbide laurate	Oleic alcohol
Glycereth-7 trioctanoate	Isostearic acid	Oleostearins
Glycereth-12, -26	Isostearyl alcohol	Oleyl alcohol, O. erucate, O. oleate
Glycerol tricaprylate/caprate	Isostearyl behenate, I. benzoate	Olive ( <i>Olea europae</i> ) oil
Glyceryl adipate, G. dioleate	Isostearyl diglyceryl succinate	Orange ( <i>Citrus aurantium dulcis</i> ) peel wax
Glyceryl isostearate, G. lanolate	Isostearyl erucate, I. erucyl erucate	Orange roughy ( <i>Hoplostethus atlanticus</i> ) oil
Glyceryl linoleate, G. monopyrogutamate	Isostearyl isostearate, I. lactate	Palm ( <i>Elaeis guineensis</i> ) oil
Glyceryl myristate, G. oleate	Isostearyl malate, I. myristate	Palm kernel glycerides
Glyceryl ricinoleate	Isostearyl neopentanoate, palmitate	Palmitic acid
Glyceryl triacetyl hydroxystearate	Isostearyl stearoyl stearate	Panthenyl triacetate
Glyceryl triacetyl ricinoleate	Isostearylamidopropyl dihydroxypropyl dimonium chloride	Partially hydrogenated cinnola oil
Glycosaminoglycans	Isoridecyl isononanoate	Partially hydrogenated soybean oil
Glycosphingolipids	Isoridecyl myristate	Peach ( <i>Prunus persica</i> ) extract
Gold of Pleasure oil	Jojoba ( <i>Bursera chinensis</i> ) oil	Peanut ( <i>Arachis hypogaea</i> ) oil
Grape ( <i>Vitis vinifera</i> ) seed oil	Jojoba butter, J. esters	Pecan ( <i>Carya illinoensis</i> ) oil
Hazel ( <i>Corylus avellana</i> ) nut oil	Jojoba oil, synthetic	PEG-2 diisononanoate, P. dioctanoate
Helianthus annuus ethyl ester	Kukui ( <i>Aleurites moluccana</i> ) nut oil	PEG-2 milk solids
Hexadecyl isopalmitate	Lactamide DGA	PEG-4
Hexamethyldisiloxane	Laneth-10 acetate	PEG-4 dibenzoate, P. dilaurate
Hexyl laurate	Lanolin, L. acid	PEG-5 C3-12 alcohols citrate
Hexyldecanol	Lanolin alcohol, L. oil	PEG-5 C14-18 alcohols citrate
Hexyldodecyl stearate	Lanolin, ultra anhydrous	PEG-5 hydrogenated castor oil
Honey extract	Lanolin wax	PEG-5 hydrogenated castor oil trisostearate
Hybrid safflower ( <i>Carthamus tinctorius</i> ) oil	Lanosterol	PEG-6
Hybrid sunflower ( <i>Helianthus annuus</i> ) oil	Lard glyceride	PEG-6 capric/caprylic glycerides
Hydrogenated C6-14 olefin polymers	Laureth-2, -3	PEG-7 glyceryl cocoate
Hydrogenated castor oil	Laureth-2 acetate, L. benzoate	PEG-8
Hydrogenated castor oil laurate	Laureth-2-octanoate	PEG-8 dilaurate, P. dioleate
Hydrogenated coconut oil	Lauric/palmitic/oleic triglyceride	PEG-8/SMDI copolymer
Hydrogenated cottonseed oil	Lauryl behenate, L. lactate	PEG-9 stearyl stearate
Hydrogenated C12-18 triglycerides	Lauryl phosphate	PEG-10 stearyl stearate
Hydrogenated lanolin	Lauryl dimethylamine isostearate	PEG-12
Hydrogenated lanolin, distilled	Lesquerella fendleri oil	PEG-12 dioleate, P. palm kernel glycerides
Hydrogenated lecithin	Linoleic acid	PEG-15 cocamine oleate/phosphate
Hydrogenated milk lipids	Macadamia ternifolia nut oil	PEG-18
Hydrogenated mink oil	Malted soybean oil	PEG-20
Hydrogenated palm kernel glycerides	Mango ( <i>Mangifera indica</i> ) oil, seed oil	PEG-20 hydrogenated castor oil isostearate
Hydrogenated palm oil	Mango kernel oil	PEG-20 hydrogenated castor oil trisostearate
Hydrogenated polyisobutene	Meadowfoam ( <i>Limnanthes alba</i> ) seed oil	PEG-20 hydrogenated lanolin
Hydrogenated soybean oil	Menhaden ( <i>Brevoortia tyrannus</i> ) oil	PEG-24 hydrogenated lanolin
Hydrogenated starch hydrolysate	Methyl acetyl ricinoleate	PEG-25 PABA, P. propylene glycol stearate
Hydrogenated tallow glyceride	Methyl gluceth-20	PEG-40 glyceryl laurate
Hydrogenated tallow glyceride lactate	Methyl gluceth-20 benzoate, M. g. distearate	PEG-40 hydrogenated castor oil isostearate
Hydrogenated turtle oil	Methyl hydroxystearate, M. ricinoleate	PEG-40 hydrogenated castor oil laurate
Hydrogenated vegetable glycerides	Microcrystalline wax	PEG-40 hydrogenated castor oil trisostearate
Hydrogenated vegetable oil	Mineral oil ( <i>Paraffinum liquidum</i> )	PEG-40 jojoba oil
Hydrolyzed collagen	Mink oil	PEG-50 hydrogenated castor oil laurate
Hydrolyzed conchionin protein	Musk rose ( <i>Rosa moschata</i> ) oil	PEG-50 hydrogenated castor oil trisostearate
Hydrolyzed keratin	Myreth-3	PEG-60 Shea butter glycerides
Hydrolyzed mushroom ( <i>Tricholoma matsutake</i> ) extract	Myreth-3 caprate, M. laurate	PEG-70 mango glycerides
Hydrolyzed oat protein	Myreth-3 myristate, M. octanoate	PEG-75
Hydroxylated lanolin	Myristyl alcohol, M. lactate	PEG-75 lanolin, P. Shea butter glycerides
Hydroxylated milk glycerides	Myristyl myristate, M. octanoate	PEG-75 Shea butter glycerides
Hydroxystearic acid	Myristyl propionate, M. stearate	PEG-150
Ilipi butter	Neatsfoot oil	PEG/PPG-17/6 copolymer
Isobutyl palmitate, I. stearate	Necm ( <i>Melia azadirachta</i> ) seed oil	Pentaerythrityl dioleate
Isocetyl behenate, I. octanoate	Neopentyl glycol dicaprate	Pentaerythrityl isostearate/caprate/caprylate/adipate
Isocetyl palmitate, I. salicylate	Neopentyl glycol dicaprate/dicaprylate	Pentaerythrityl stearate
Isocetyl stearate	Neopentyl glycol diisooctanoate	Pentaerythrityl stearate/caprate/caprylate/adipate
Isodeceth-2 cocate	Neopentyl glycol dioctanoate	Pentaerythrityl tetraacrylate/tetradecaprate
Isodecyl citrate, I. cocate	Oat ( <i>Avena sativa</i> ) bran extract, extract, flour	Pentaerythrityl tetraisononanoate, P. tetraisoostearate
Isodecyl isononanoate, I. laurate	Ocacosanyl stearate	Pentaerythrityl tetralaurate, P. tetraoctanoate
Isodecyl neopentanoate	Octyl cocate	Pentaerythrityl tetraoleate, P. tetrapelargonate
Isodecyl octanoate, I. oleate	Octyl hydroxystearate, O. isononanoate	Pentaerythrityl tetrastearate
Isodecyl stearate	Octyl neopentanoate, O. octanoate	Perfluorodecalin
Isododecane	Octyl oleate, O. palmitate	Perfluoropolyethylisopropyl ether
Isocicosane	Octyl pelargonate, O. stearate	Petrolatum
Isonehexadecane	Ocnyldodecanol	Phenethyl dimethicone

1.20

Cosmetic Bench Reference 1996

## Functions

Phytantriol	PPG-8/SMDI copolymer	Propylene glycol myristyl ether acetate
Pistachio (Pistacia vera) nut oil	PPG-9	Propylene glycol stearate, SE
Placental enzymes	PPG-9-buteth-12	Pumpkin (Cucurbita pepo) seed oil
Pollen extract	PPG-9 butyl ether	Quinoa (Chenopodium quinoa) oil
Poloxamer 105 benzoate	PPG-10 butanediol, P. cetyl ether	Rapeseed (Brassica camoesinis) oil
Poloxamer 182 dibenzoate	PPG-10 methyl glucose ether	Rice (Oryza sativa) bran oil, bran wax
Polybutene	PPG-10 oleyl ether	Rice fatty acid
Polydecene	PPG-11 stearyl ether	Safflower (Carthamus tinctorius) oil
Polydimethicone copolyol	PPG-12-buteth-16	Salmon (Salmo) egg extract
Polyethylene glycol	PPG-12-PEG-50 lanolin	Sesame (Sesamum indicum) oil
Polyglyceryl-2 diisostearate, P. tetrastearate	PPG-12-PEG-65 lanolin oil	Shark liver oil
Polyglyceryl-2 triisostearate	PPG-12/SMDI Copolymer	Shea butter (Butyrospermum parkii)
Polyglyceryl-3 diisostearate, P. oleate	PPG-14 butyl ether	Shea butter (Butyrospermum parkii) extract
Polyglyceryl-3 stearate	PPG-15 butyl ether, P. stearyl ether	Shea butter, ethoxylated
Polyglyceryl-6 dioleate	PPG-15 stearyl ether benzoate	Shorea stenoptera butter
Polyglyceryl-10 decioleate, P. decastearate	PPG-16 butyl ether	Silybum marianum ethyl ester
Polyglyceryl-10 tetraoleate	PPG-18 butyl ether	Sitostearyl acetate
Polyisobutene	PPG-20	Skin lipids
Polyisobutene:isohexapentacontahexane	PPG-20-buteth-30	Slippery elm extract
Polyisobutene:isooctahexacontane	PPG-20 cetyl ether	Sodium C8-16 isoalkylsuccinyl lactoglobulin sulfonate
Polyisobutene:isopentacontaoctane	PPG-24-glycereth-24	Sodium carboxymethyl beta-glucan
Polyisoprene	PPG-26	Sodium ceteth-13-carboxylate
Polyoxyethylene polyoxypropylene glycol	PPG-27 glyceryl ether	Sodium dimethicone copolyol acetyl methylaurate
Polyquaternium-2	PPG-28-buteth-35	Sodium glyceryl oleate phosphate
Polyloxane polyalkylene copolymer	PPG-30	Sodium hyaluronate, S. polymethacrylate
Polyorbate 40	PPG-30 cetyl ether	Sorbeth-20
Potassium dimethicone copolyol phosphate	PPG-40 butyl ether	Sorbitan isostearate, S. palmitate
PPG-2-buteth-3	PPG-50 cetyl ether, P. oleyl ether	Sorbitan sesquioleate, S. sesquisteate
PPG-2 lanolin alcohol ether	PPG-51/SMDI Copolymer	Sorbitan trioleate
PPG-2 myristyl ether propionate	PPG-53 butyl ether	Soybean (Glycine soja) oil
PPG-3 hydrogenated castor oil	Propylene glycol ceteth-3 acetate	Spermaceti
PPG-3 myristyl ether	Propylene glycol dicaprylate	Sphingolipids
PPG-5-buteth-7	Propylene glycol dicaprylate:dicaprate	Squalene
PPG-5-laureth-5	Propylene glycol diisostearate, P.g. dioctanoate	Stearamidopropyl cetearyl dimonium tosylate
PPG-5 butyl ether	Propylene glycol dipalargonate	Steareth-4 stearate
PPG-5 lanolin wax	Propylene glycol isoceteth-3 acetate	Stearic acid, S. hydrazide
PPG-5 pentaerythrityl ether	Propylene glycol isostearate, P.g. laurate	Stearoxy dimethicone
PPG-7-buteth-10	Propylene glycol myristate	

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## Functions

Stearoxymethacrylate/dimethacrylate copolymer  
 Stearyl behenate, S. benzoate  
 Stearyl dimethacrylate, S. erucate  
 Stearyl heptanoate, S. propionate  
 Stearyl stearate  
 Stearyl stearyl stearate  
 Sucrose cocaoate  
 Sunflower (*Helianthus annuus*) seed oil  
 Sweet almond (*Prunus amygdalus dulcis*) oil  
 Sweet cherry (*Prunus avium*) pit oil  
 Synthetic jojoba oil  
 Synthetic wax  
 Tallow  
 Tetradecylcyclohexyl stearate  
 Tocopheryl acetate  
 Tricaprin  
 Tricaprylin  
 Tricaprylyl citrate  
 Tricholoma matsutake extract  
 Tridecyl behenate, T. cocoate  
 Tridecyl erucate, T. neopentanoate  
 Tridecyl octanoate, T. stearate  
 Tridecyl stearoyl stearate  
 Tridecyl trimellitate  
 Trihexyldecyl citrate  
 Trisocetyl citrate  
 Trisosteann  
 Trisostearyl citrate  
 Trisostearyl trilinoleate  
 Trilaurin  
 Trilinolein  
 Trimethylolpropane tricaprylate/tricaprate  
 Trimethylolpropane tricoate  
 Trimethylolpropane trilaurate  
 Trimyrstin  
 Triolein  
 Trioleyldecyl citrate  
 Triolein  
 Tripalmitin  
 Tripropylene glycol citrate  
 Tristearin  
 Triundecanoic  
 Vegetable oil  
 Walnut (*Juglans regia*) oil  
 Wheat (*Triticum vulgare*) germ oil

**Emulsifier**

Acetylated hydrogenated lard glyceride  
 Acetylated hydrogenated vegetable glyceride  
 Acetylated monoglycerides  
 Acrylates/C10-C30 alkyl acrylate copolymer  
 Acrylates/vinyl isodecanoate copolymer  
 Acrylic acid/acrylonitrile copolymer  
 2-Aminobutanol  
 Ammonium acrylates/acrylonitrile copolymer  
 Arachidyl alcohol  
 Beeswax  
 Behenamidopropyl dihydroxypropyl dimonium chloride  
 Beheneth-5 -10 -20 -30  
 Benenic acid  
 Behenyl betaine  
 Borateamidopropyl phosphatidyl PG-dimonium chloride  
 Butylocetanol  
 C12-20 acid PEG-8 ester  
 C18-36 acid  
 Calcium dodecylbenzene sulfonate  
 Calcium protein complex

Calcium stearate  
 Calcium stearyl lactylate  
 Capramide DEA  
 Caprylic/capric acid  
 Caprylic/capric glycerides  
 Castor oil, ethoxylated  
 Cetalkonium chloride  
 Cetareth-2 -4 -5 -6  
 Cetareth-2 phosphate  
 Cetareth-5 phosphate  
 Cetareth-8 -10 -11 -12  
 Cetareth-10 phosphate  
 Cetareth-15 -17 -20 -25  
 Cetareth-27 -29 -30 -34  
 Cetearyl alcohol  
 Cetearyl glucoside  
 Ceteth-2 -4 -6 -10 -12 -13  
 Ceteth-16 -20 -25 -30 -33  
 Cetethyldimonium bromide  
 Cetrimonium chloride  
 Cetyl dimethacrylate copolyol  
 Cetyl phosphate  
 Cholesterol  
 Choleth-10 -15 -24  
 Cocamide DEA, C. MEA  
 Cocamidopropyl dimethylamine  
 Cocamidopropyl PG-dimonium chloride phosphate  
 Cocamine  
 Coceth-7 carboxylic acid  
 Coconut acid  
 Copper protein complex  
 Cottonseed glyceride  
 C12-13 pareth-3 -4 -9 -23  
 C16-18 pareth-3 -5-5 -13 -19  
 Cyclodextrin  
 Decaglycerol monododecylate  
 DEA-cetareth-2-phosphate  
 DEA-cetyl phosphate  
 DEA-cyclohexyloxypropylololate  
 DEA-oleth-3 phosphate  
 DEA-oleth-5-phosphate  
 DEA oleth-10 phosphate  
 DEA-oleth-20-phosphate  
 Decetareth-10 phosphoric acid  
 Diethanolamine  
 Diethylaminoethyl stearate  
 Diglyceryl stearate malate  
 Dihydrocholeth-15 -20 -30  
 Dihydrogenated tallow phthalic acid amide  
 Dilauryl acetyl dimonium chloride  
 Dilinoleamidopropyl dimethylamine dimethicone copolyol phosphate  
 Dilinoleic acid  
 Dimethicone copolyol almondate  
 Dimethicone copolyol isostearate  
 Dimethicone copolyol laurate  
 Dimethicone copolyol methyl ether  
 Dimethicone copolyol olive  
 Dimethicone copolyol phthalate  
 Dipalmitoyl ethyl hydroxyethylmethylmethosulfate  
 Dipropylene glycol  
 Disodium hydrogenated cottonseed glyceride sulfosuccinate  
 Disodium ricinoleamide MEA-sulfosuccinate  
 Disodium stearyl sulfosuccinate  
 Disodium sulfosuccinamide  
 Distearyl phthalic acid amide

N-Dodecyl-N,N-dimethyl-N-(dodecyl acetate) ammonium chloride  
 Dodecylphenol-ethylene oxide condensate  
 Egg (Ovum) yolk extract  
 Emulsifying wax NF  
 Ethoxylated fatty alcohol  
 N-Ethylether-bis-1,4-(N-isostearylamidopropyl-N,N-dimethyl ammonium chlo  
 Ethyl hexanediol  
 Euglena gracilis polysaccharide  
 Glyceth-26 phosphate  
 Glyceryl caprylate, G. caprylate/caprate  
 Glyceryl citrate/lactate/linoleate/oleate  
 Glyceryl cocoate, G. dilaurate  
 Glyceryl dilaurate, G. dioleate  
 Glyceryl distearate, G. hydroxystearate  
 Glyceryl isostearate, G. lanolate  
 Glyceryl laurate, G. linoleate  
 Glyceryl mono-di-tri-caprylate  
 Glyceryl myristate, G. oleate  
 Glyceryl palmitate, G. ricinoleate  
 Glyceryl ricinoleate SE  
 Glyceryl stearate, G. stearate citrate  
 Glyceryl stearate lactate  
 Glyceryl stearate SE  
 Glyceryl undecylenate  
 Glycol distearate, G. oleate  
 Glycol palmitate, G. stearate  
 Glycol stearate SE  
 Glycolamide stearate  
 Glycosphingolipids  
 Hydrogenated coco-glycerides  
 Hydrogenated cottonseed glyceride  
 Hydrogenated lanolin  
 Hydrogenated lecithin  
 Hydrogenated palm oil  
 Hydrogenated soy glyceride  
 Hydrogenated tallow glycerides  
 Hydrogenated tallow glycerides citrate  
 Hydroxyethyl phosphate  
 Hydroxylated lanolin  
 Hydroxylated lecithin  
 Hydroxyoctacosanyl hydroxystearate  
 Hydroxypropyl-bis-  
 isostearylamidopropyl dimonium chloride  
 Isocetareth-8 stearate  
 Isoceteth-10 stearate  
 Isoceteth-20  
 Isocetyl alcohol  
 Isolaureth-6  
 Isostearamidopropyl dimethylamine glucosate  
 Isostearamidopropyl dimethylamine glycolate  
 Isostearamidopropyl laurylacetodimonium chloride  
 Isosteareth-2 -3 -10 -12 -20 -22 -30  
 Isosteareth-2-octanoate  
 Isosteareth-10 stearate  
 Isostearic acid  
 Isostearyl diglyceryl succinate  
 Isostearylamidopropyl dihydroxypropyl dimonium chloride  
 Karaya (*Sterculia urens*) gum  
 Laneth-5 -10 -15 -16 -20 -40  
 Laneth-10 acetate  
 Lanolin  
 Lanolin alcohol  
 Lanolin, ultra anhydrous  
 Lanolin wax  
 Lauramide DEA, L. MEA

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## Functions

Lauramidopropyl dimethylamine	PEG-5 lanolate, P. oleamine	PEG-20 lanolin, P. laurate
Lauramidopropyl PG-dimonium chloride	PEG-5 soy sterol, P. soyamine	PEG-20 oleate
Laureth-1 -2 -3 -4 -5	PEG-5 stearamine, P. stearate	PEG-20 methyl glucose sesquistearate
Laureth-2 octanoate	PEG-5 tallow amine	PEG-20 sorbitan beeswax
Laureth-3 phosphate	PEG-6 capric/caprylic glycerides	PEG-20 sorbitan isosteate
Laureth-4 carboxylic acid	PEG-6 cocamide	PEG-20 sorbitan trisostearate
Laureth-5 carboxylic acid	PEG-6 C12-14 ether	PEG-20 sorbitan trioleate
Laureth-6 -7 -9 -11 -12	PEG-6 dilaurate, P. dioleate	PEG-20 stearate, P. tallow amine
Laureth-11 carboxylic acid	PEG-6 distearate, P. isosteate	PEG-23 oleate, P. stearate
Laureth-16 -20 -23 -25 -30	PEG-6 lauramide, P. laurate	PEG-24 hydrogenated lanolin
Lauryl PCA	PEG-6 oleate, P. palmitate	PEG-25 castor oil
Laurylmethicone copolyol	PEG-6 sorbitan beeswax	PEG-25 phytosterol
Lecithin	PEG-6 sorbitan laurate	PEG-25 propylene glycol stearate
Linoleamidopropyl PG-dimonium chloride	PEG-6 sorbitan oleate	PEG-25 soy sterol, P. stearate
phosphate	PEG-6 sorbitan stearate	PEG-29 castor oil
Lithium stearate	PEG-6 stearate	PEG-30 castor oil
Magnesium sulfate hepta-hydrate	PEG-6-32	PEG-30 dipolyhydroxystearate
Maleated soybean oil	PEG-6-32 stearate	PEG-30 glyceryl cocoate
Methoxy PEG-17/dodecyl glycol copolymer	PEG-7 glyceryl cocoate	PEG-30 glyceryl isosteate
Methyl gluceth-20 distearate	PEG-7 hydrogenated castor oil	PEG-30 glyceryl laurate
Methyl glucose dioleate, M. g. sesquisteate	PEG-7 oleate	PEG-30 glyceryl oleate
Methyl glucose sesquisteate	PEG-7.5 tallowamine	PEG-30 glyceryl stearate
MEA-laureth sulfate	PEG-8	PEG-30 hydrogenated castor oil
Myreth-3 -4 -7	PEG-8 beeswax, P. castor oil	PEG-30 lanolin
Myreth-3 myristate	PEG-8 C12-14 ether	PEG-30 sorbitan tetraoleate
Myristamidopropyl dimethylamine	PEG-8 dilaurate, P. dioleate	PEG-32 dilaurate, P. dioleate
Nonoxynol-1 -2 -3 -5 -6 -7	PEG-8 distearate	PEG-32 distearate, P. laurate
Nonoxynol-8 -9 -10 -11 -12 -13	PEG-8 glyceryl laurate	PEG-32 oleate, P. stearate
Nonoxynol-14 -15 -18 -20 -30 -40 -50	PEG-8 laurate, P. oleate	PEG-33 castor oil
Nonyl nonoxynol-5 -10	PEG-8, P. tallate	PEG-35 castor oil, P. stearate
Oat (Avena sativa) flour	PEG-9 castor oil	PEG-40 castor oil
Octoxynol-1 -3 -5 -8 -10	PEG-9 diisosteate	PEG-40 glyceryl isosteate
Octoxynol 16, 30, 40	PEG-9 dioleate, P. distearate	PEG-40 glyceryl laurate
2-Octyl dodecyl alcohol	PEG-9 laurate, P. oleate	PEG-40 glyceryl trisosteate
Octyldodecanol	PEG-9 stearate	PEG-40 hydrogenated castor oil
Octyldodeceth-20 -25	PEG-10 castor oil, P. cocamine	PEG-40 hydrogenated castor oil PCA isosteate
Oleamide DEA	PEG-10 coconut oil esters	PEG-40 sorbitan diisosteate
Oleamidopropyl dimethylamine	PEG-10 C12-18 alcohols	PEG-40 sorbitan lanolate
Oleamine oxide	PEG-10 dioleate	PEG-40 sorbitan tetraoleate
Oleic acid	PEG-10 glyceryl isosteate	PEG-40 stearate
Oleth-2 -3 -4 -5 -6 -7 -8 -9	PEG-10 hydrogenated castor oil	PEG-40/dodecyl glycol copolymer
Oleth-10 -12 -15 -20 -23	PEG-10 hydrogenated castor oil trisosteate	PEG-42 babassu glycerides
Oleth-25 -30 -40 -50	PEG-10 lanolate	PEG-44 sorbitan laurate
Oleth 13	PEG-10 polyglyceryl-2 laurate	PEG-45 palm kernel glycerides
Oleth-2 phosphate	PEG-10 sorbitan laurate	PEG-45 safflower glycerides
Oleth-3 phosphate	PEG-10 soy sterol, P. stearamine	PEG-50 lanolin, P. laurate
Oleth-5 phosphate	PEG-10 stearate	PEG-50 stearate
Oleth-10 phosphate	PEG-11 babassu glycerides	PEG-60 almond glycerides
Oleth-20 phosphate	PEG-11 castor oil	PEG-60 castor oil
Palm acid	PEG-12 dilaurate, P. dioleate	PEG-60 corn glycerides
Palmitamidopropyl dimethylamine	PEG-12 distearate	PEG-60 glyceryl trisosteate
Palmitic acid	PEG-12 glyceryl dioleate	PEG-60 hydrogenated castor oil
PEG-2 cocamine, P. distearate	PEG-12 laurate, P. oleate	PEG-60 hydrogenated castor oil isosteate
PEG-2 hydrogenated tallow amine	PEG-12 stearate, P. tallate	PEG-60 hydrogenated castor oil trisosteate
PEG-2 laurate, P. laurate SE	PEG-14 avocado glycerides	PEG-60 shea butter glycerides
PEG-2 oleamine, P. oleate	PEG-15 castor oil	PEG-60 sorbitan tetraoleate
PEG-2 soyamine, P. stearamine	PEG-15 cocamide	PEG-70 mango glycerides
PEG-2 stearate, P. stearate SE	PEG-15 glyceryl isosteate	PEG-75
PEG-3 cocamide	PEG-15 glyceryl laurate	PEG-75 castor oil, P. dilaurate
PEG-3 C12-C18 alcohols	PEG-15 glyceryl ricinoleate	PEG-75 dioleate, P. distearate
PEG-3 glyceryl isosteate	PEG-15 oleamine, P. oleate	PEG-75 lanolin, P. laurate
PEG-3 glyceryl trisosteate	PEG-15, P. stearamine	PEG-75 oleate
PEG-3 lanolate, P. sorbitan oleate	PEG-15 tallow amine	PEG-75 shea butter glycerides
PEG-3 stearate	PEG-15 tallow polyamine	PEG-75 stearate
PEG-4 dioleate, P. diisosteate	PEG-16	PEG-80 sorbitan laurate
PEG-4 dilaurate, P. distearate	PEG-16 hydrogenated castor oil	PEG-90 stearate
PEG-4 glyceryl distearate	PEG-16 soy sterol	PEG-100 castor oil
PEG-4 laurate, P. oleate	PEG-18 stearate	PEG-100 hydrogenated castor oil
PEG-4 stearate	PEG-20 almond glycerides	PEG-100 lanolin, P. stearate
PEG-4 stearyl stearate	PEG-20 castor oil, P. dilaurate	PEG-120 distearate
PEG-4 tallate	PEG-20 dioleate, P. distearate	PEG-150 dilaurate, P. dioleate
PEG-5 castor oil, P. cocamine	PEG-20 glyceryl laurate	PEG-150 distearate, P. lanolin
PEG-5 C12-C18 alcohols	PEG-20 glyceryl oleate	PEG-150 laurate, P. oleate
PEG-5 glyceryl isosteate	PEG-20 glyceryl stearate	PEG-150 stearate
PEG-5 glyceryl sesquileate	PEG-20 glyceryl trisosteate	PEG-200 castor oil
PEG-5 glyceryl stearate	PEG-20 glyceryl trisostearate	PEG-200 glyceryl stearate
PEG-5 glyceryl trisosteate	PEG-20 hydrogenated castor oil	PEG-200 hydrogenated castor oil
PEG-5 glyceryl trisostearate	PEG-20 hydrogenated lanolin	

Cosmetic Bench Reference 1006

## Functions

PEG-200 laurate, P. oleate  
 PEG-400 laurate  
 Phosphate esters  
 Phosphated amine oxides  
 Phospholipids  
 Poloxamer 101, 102, 122, 123, 124  
 Poloxamer 181, 182, 184, 185, 235, 237  
 Poloxamer 238, 334, 338, 407  
 Polyglyceryl-2 oleate  
 Polyglyceryl-2 polyhydroxystearate  
 Polyglyceryl-2 sesquioleate  
 Polyglyceryl-2 stearate  
 Polyglyceryl-2, PEG-4-distearate  
 Polyglyceryl-2, PEG-4 stearate  
 Polyglyceryl-3 diisoleate, P. dioleate  
 Polyglyceryl-3 distearate  
 Polyglyceryl-3 methylglucose distearate  
 Polyglyceryl-3 oleate, P. polyricinoleate  
 Polyglyceryl-3 stearate  
 Polyglyceryl-4 oleate, P. stearate  
 Polyglyceryl-6 dioleate, P. distearate  
 Polyglyceryl-6 laurate, P. myristate  
 Polyglyceryl-6 oleate, P. polyricinoleate  
 Polyglyceryl-6 stearate  
 Polyglyceryl-8 oleate  
 Polyglyceryl-10 decanoate  
 Polyglyceryl-10 diisoleate  
 Polyglyceryl-10 dioleate, P. dipalmitate  
 Polyglyceryl-10 dioleate, P. isostearate  
 Polyglyceryl-10 laurate, P. linoleate  
 Polyglyceryl-10 mixed fatty acids  
 Polyglyceryl-10 myristate  
 Polyglyceryl-10 oleate  
 Polyglyceryl-10 pentastearate  
 Polyglyceryl-10 stearate  
 Polyglyceryl-10 trimaleate  
 Polyglyceryl-10 trimaleate  
 Polyoxyethylene polyoxypropylene glycol  
 Polyquaternium-5, -11  
 Polysorbate 20, 21, 40, 60, 61  
 Polysorbate 65, 80, 81, 85  
 Potassium alginate, P. cetyl phosphate  
 Potassium laurate, P. myristate  
 Potassium tallowate  
 PPG-1-PEG-9 lauryl glycol ether  
 PPG-2-ceteareth-9  
 PPG-3 isosteareth-9  
 PPG-3 PEG-6 oleyl ether  
 PPG-5-buteth-7  
 PPG-5-ceteth-20  
 PPG-5-ceteth-10 phosphate  
 PPG-8 oleate  
 PPG-10 cetyl ether phosphate  
 PPG-12-PEG-50 lauridin  
 PPG-15 stearyl ether  
 PPG-24-buteth-27  
 PPG-25 laureth-25  
 PPG-26-buteth-26  
 PPG-26 oleate  
 PPG-36 oleate  
 Propylene glycol alginate, P.g. dioleate  
 Propylene glycol hydroxystearate  
 Propylene glycol laurate, P.g. ricinoleate  
 Propylene glycol ricinoleate SE  
 Propylene glycol stearate  
 Propylene glycol stearate, SE  
 Quaternium-33  
 Rapeseedamidopropyl ethyldimonium ethosulfate  
 Rice (*Oryza sativa*) bran wax  
 Ricinoleamide DEA  
 Ricinoleic acid  
 Saponins  
 Selenium protein complex  
 Silicene quaternium-5, -6  
 Sodium acrylates/acrylonitrile copolymer  
 Sodium capryl lactate  
 Sodium carboxymethyl cellulose  
 Sodium cetyl sulfate

Sodium C12-15 pareth-15 sulfonate  
 Sodium isostearoyl lactylate  
 Sodium laureth-17 carboxylate  
 Sodium lauroyl lactylate  
 Sodium lauryl sulfate  
 Sodium nonoxynol-6 phosphate  
 Sodium oleyl sulfate  
 Sodium oleate  
 Sodium oleyl sulfate  
 Sodium phosphate  
 Sodium stearoyl lactylate  
 Sorbeth-20  
 Sorbitan isostearate, S. laurate  
 Sorbitan oleate, S. palmitate  
 Sorbitan sesquiosulfate  
 Sorbitan sesquiosulfate  
 Sorbitan stearate, S. tristearate  
 Sorbitan trioleate, S. tristearate  
 Soyamidopropyl dimethylamine  
 Soyamine  
 Stearamide DEA  
 Stearamide DIBA-stearate  
 Stearamidoethyl diethylamine  
 Stearamidopropyl dimethylamine lactate  
 Stearamidopropyl PG-dimonium chloride phosphate  
 Stearamine  
 Stearamine oxide  
 Steareth-2, -4, -6, -7, -10, -11, -13  
 Steareth-2 phosphate  
 Steareth-15, -20, -21, -30, -100  
 Stearic acid  
 Sucrose cocoate, S. distearate  
 Sucrose stearate  
 Synthetic beeswax  
 Tallow glyceride, acetylated hydrogenated  
 Tallowamide DEA

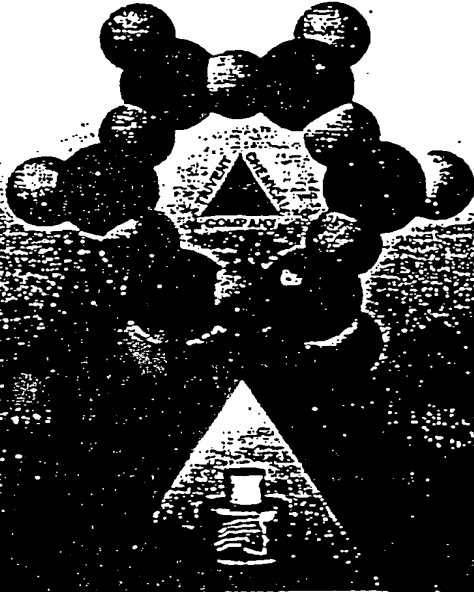
Tallowamidopropyl dimethylamine  
 Talloweth-6  
 Tetrasodium dicarboxyethyl stearyl sulfosuccinamide  
 TEA-acrylates/acrylonitrile copolymer  
 Tissue extract  
 Tricetareth-4 phosphate  
 Trideceth-3, -5, -6, -7, -8  
 Trideceth-9, -10, -12, -15  
 Tridecyl ethoxylate  
 Triethanolamine  
 Trilaureth-4 phosphate  
 Triolein  
 Trisodium HEDTA  
 Tristearin

**Enzyme**

Fermented vegetable  
 Ganoderma lucidum oil  
 Lipase  
 Papain  
 Soy (Glycine soja) protein  
 Superoxide dismutase

**Essential oil**

Aesculus chinensis extract  
 Artemisia apiacea extract  
 Brassica rapa-depressa extract  
 Caraway (*Carum carvi*) oil  
 Cardamon (*Elettaria cardamomum*) oil  
 Clove (*Eugenia caryophyllus*) oil  
 Eclipta alba extract  
 Eucalyptus globulus oil  
 Eupatorium fortunei extract  
 Euterpe precatoria extract  
 Hieracium odorata extract  
 Kadsura beteliloca extract



**Trivent Chemical Company, Inc.**

4266 US Rt. 1, P.O. Box 194 • Monmouth Junction, NJ 08852 • 908-432-0235 • Fax 908-432-1021



## Functions

Ligustrum lucidum extract  
 Lysimachia foenum-graecum extract  
 Melaleuca bracteata extract  
 Melaleuca hypericifolia extract  
 Melaleuca symphyocarp extract  
 Melaleuca uncinata extract  
 Melaleuca wilsonii extract  
 Nasturtium sinensis extract  
 Nelumbium speciosum extract  
 Paulownia imperialis extract  
 Rosemary (Rosmarinus officinalis) oil  
 Selinum spp. extract  
 Trichomonas japonica extract  
 Withania somniferum extract  
 Yuzu oil  
 Ziziphus jujuba extract

**Exfoliant**

Apricot (Prunus armeniaca) kernel powder  
 Glycolic acid  
 Jojoba (Buxus chinensis) seed powder  
 Lactic acid  
 Papain  
 PEG 11-Avocado Glycerdies  
 Willow (Salix alba) bark extract

**Fiber**

Corn (Zea mays) cob powder  
 Nylon-66  
 Oat (Avena sativa) bran, meal  
 Rayon

**Film former**

Acetylated lanolin  
 Acrylates/hydroxyesters acrylates copolymer  
 Acrylates/octylarylamide copolymer  
 Acrylates copolymer  
 Alkylated polyvinylpyrrolidone  
 Ammonium acrylates/acrylonitril copolymer  
 Betaglucon  
 Bladderwrack (Fucus vesiculosus) extract  
 Carboxymethylchitosan  
 N,O-Carboxymethylchitosonium  
 Chitosan lactate  
 Collagen  
 Collagen phthalate  
 Colloidal oatmeal  
 Desamido collagen  
 Diisostearyl trimethylolpropane siloxy silicate  
 DMHF  
 Ethyl ester of hydrolyzed silk  
 Ethylcellulose  
 Gellan gum  
 Glycerin/diethylene glycol/adipate crosspolymer  
 High beta-glucan barley flour  
 Hydrolyzed collagen  
 Hydrolyzed keratin  
 Hydrolyzed oat protein  
 Hydrolyzed pea protein  
 Hydrolyzed reticulin  
 Hydrolyzed RNA  
 Hydrolyzed silk  
 Hydrolyzed soy protein  
 Hydrolyzed wheat protein  
 Hydrolyzed wheat protein/dimethicone copolyol  
 phosphate copolymer  
 Hydrolyzed wheat protein/PVP copolymer  
 Hydroxypropylcellulose  
 Hydroxypropyltrimonium gelatin  
 Jojoba (Buxus chinensis) oil  
 Lactoglobulin  
 Myristoyl hydrolyzed collagen  
 Nitrocellulose  
 Oat (Avena sativa) extract, protein  
 Polyethylene, ionomer  
 Polyquaternium-6, -7, -11, -22, -39  
 Polyvinyl acetate, P. alcohol  
 Povidone

PVM/MA decadiene crosspolymer  
 PVP/Dimethylacrylate/polycarbonyl  
 polyglycol ester  
 PVP/dimethylaminoethylmethacrylate copolymer  
 PVP/dimethylaminoethylmethacrylate/  
 polycarbonyl/polyglycol ester  
 PVP/eicosene copolymer  
 PVP/hexadecene copolymer  
 PVP/hydrolyzed wheat protein copolymer  
 Rice peptide  
 Sericin  
 Shea butter (Butyrospermum parkii)  
 Shellac  
 Sodium C12-15 pareth-7 sulfonate  
 Sodium hyaluronate  
 Soluble collagen  
 Soluble keratin  
 Soluble wheat protein  
 TEA-acrylates/acrylonitril copolymer  
 Tosylamide/epoxy resin  
 Tricostanyl PVP  
 Triethonium hydrolyzed collagen ethosulfate  
 Wheat peptide

**Fixative**

Acrylates copolymer  
 Adipic acid/dimethylaminohydroxypropyl  
 diethylene triamine copolymer  
 AMP-acrylates copolymer  
 Hydrolyzed zein  
 Methacryloyl ethyl betaine/acrylates copolymer  
 Methyl rosinate  
 Polyquaternium-1, -10, -29  
 PPG-20 methyl glucose ether  
 Sodium polystyrene sulfonate

**Flavor (aroma)**

Benzaldehyde  
 Caraway (Carum carvi) oil  
 Cardamom (Elettaria cardamomum) oil  
 Cinnamon (Cinnamomum cassia) oil  
 Clove (Eugenia caryophyllus) oil  
 Ethyl vanillin  
 Eucalyptus globulus oil  
 Flavor (aroma)  
 Glutamic acid  
 Glycyrrhetic acid  
 Glycyrrhizic acid  
 Glycyrrhizin, ammoniated  
 Methyl salicylate  
 Orange (Citrus aurantium dulcis) oil  
 Peppermint (Mentha piperita) oil  
 Rosemary (Rosmarinus officinalis) oil  
 Sodium glycyrrhizinate  
 Thymol  
 Vanillin

**Foam booster**

Alkyldimethylamine oxide  
 Babassuamidopropyl betaine  
 Babassuamidopropylamine oxide  
 Caprylyl pyrrolidone  
 Carrageenan (Chondrus crispus)  
 Cocamide DEA, C, MIPA  
 Cocamidopropyl betaine  
 Cocamidopropyl dimethylamine lactate  
 Cocamidopropyl hydroxysultaine  
 Coco-betaine  
 Coco/oleamidopropyl betaine  
 Cocoyl amido hydroxy sulfo betaine  
 Cocoyl monoethanolamide ethoxylate  
 DEA-hydrolyzed lecithin  
 Dimethyl lauramine  
 Disodium cocamide MEA-sulfosuccinate  
 Disodium cocoamphodiacetate  
 Disodium lauramide MEA-sulfosuccinate  
 Disodium laureth sulfosuccinate  
 Lauramide MIPA

Lauramidopropyl betaine  
 Lauryl betaine  
 Myristamidopropyl dimethylamine dimethicone  
 copolyol phosphate  
 Myristamine oxide  
 Octyldodecyl benzoate  
 Oleamide DEA, O, MIPA  
 Oleyl betaine  
 Palm kernelamide DEA  
 PEG-3 lauramine oxide  
 PPG-15 stearyl ether benzoate  
 PEG-7000  
 Sodium cocoamphacetate  
 Sodium cocoyl isethionate  
 Sodium laureth sulfate  
 Sodium lauroyl wheat amino acids  
 Sodium octoxynol-2 ethane sulfonate  
 Soyamidopropyl betaine  
 Tallowamide MEA

**Foam stabilizer**

Babassuamidopropylamine oxide  
 Behenamide oxide  
 Caprylyl pyrrolidone  
 Cetamine oxide  
 Cocamide DEA, C, MEA, C, MIPA  
 Cocamidopropyl betaine  
 Cocamidopropyl hydroxysultaine  
 Cocamidopropyl lauryl ether  
 Cocamidopropylamine oxide  
 Cocamine oxide  
 Dihydroxyethyl C12-15 alkoxypropylamine oxide  
 Dihydroxyethyl cocamine oxide  
 Dihydroxyethyl tallowamine oxide  
 Erucamidopropyl hydroxysultaine  
 Hydroxypropyl methylcellulose  
 Isostearamide DEA  
 Lauramide DEA, L, MEA  
 Lauramidopropylamine oxide  
 Lauramine oxide  
 Laureth-10  
 Lauric-linoleic DEA  
 Lauroyl-linoleoyl diethanolamide  
 Lauroyl-myristoyl diethanolamide  
 Lauryl pyrrolidone  
 Linoleamide MEA  
 Myristamide DEA, M, MEA  
 Oleamide MEA  
 Palmitamide MEA  
 PEG-3 lauramide  
 PEG-4 oleamide  
 Ricinoleamide MEA  
 Seacamide DEA  
 Wheat germamide DEA

**Foamer**

Ammonium laureth sulfate  
 Ammonium laureth-5 sulfate  
 Ammonium laureth-12 sulfate  
 Ammonium lauryl sulfate, A, I, sulfosuccinate  
 Ammonium myreth sulfate  
 Ammonium nonoxynol 4 sulfate  
 Capryl caprylyl glucoside  
 Cetyl betaine  
 Cocamide  
 Cocamidopropyl dimethylamine  
 Cocamidopropyl dimethylamine lactate  
 DEA-laureth sulfate  
 DEA lauryl sulfate  
 Decyl glucoside  
 Disodium caproamphodiacetate  
 Disodium caproamphodipropionate  
 Disodium caprylamphodiacetate  
 Disodium cocoamphodipropionate  
 Disodium lauroamphodiacetate  
 Disodium lauroamphodipropionate  
 Disodium lauryl sulfosuccinate  
 Disodium oleamide MEA-sulfosuccinate

## Functions

Disodium oleamide MIPA-sulfosuccinate	Aluminum distearate, A. tristearate	Cetaryl trimonium methosulphate
Disodium PEG-4 cocoamide MIPA-sulfosuccinate	Ammonium acrylates/acrylonitrile copolymer	Cetrimonium bromide, C. chloride
Isoctaramidopropylamine oxide	Behenic acid	Cetyl pyridinium chloride
Lauryl glucoside	Calcium alginate	Chia (Salvia hispanica) oil
Methyl gluceth-20	Carbomer	Chrysanthemum morifolium extract
MEA-laureth sulfate	Carboxymethylchitosan	Cinchona succirubra extract
Mixed isopropanolamines myristate	N,O-Carboxymethylchitosonium	Cocamidopropyl dimethylamine propionate
MIPA-lauryl sulfate	Carageenan (Chondrus crispus)	Cococines indica extract
PEG-80 sorbitan laurate	Ceresin	Cocodimonium hydroxypropyl hydrolyzed collagen
PEG lauryl ether sulfate	Cetaryl candelillate	Cocodimonium hydroxypropyl hydrolyzed keratin
Potassium cocate, P. lauryl sulfate	Dibenzylidene sorbitol	Cocodimonium hydroxypropyl silk amino acids
Quillaja saponaria extract	Ethylene/acrylic acid copolymer	Cocodimonium hydroxypropyl hydrolyzed wheat protein
Sodium caproamphoacetate	Ethylene/VA copolymer	Cocodimonium hydroxypropyloxethyl cellulose
Sodium capryloamphoacetate	Gellan gum	Cocotrimonium chloride
Sodium cocoamphoacetate	Hexanediol behenyl beeswax	Collagen amino acids
Sodium cocoamphopropionate	Hydrogenated jojoba oil	Cyclomethicone
Sodium C12-15 pareth-25 sulfate	Hydrogenated jojoba wax	L-cysteine HCL
Sodium C12-15 pareth-3 sulfonate	Hydroxystearic acid	Dibenzylidimonium methosulfate
Sodium C12-15 pareth-15 sulfonate	Jojoba wax	Dicetyltrimonium chloride
Sodium C14-16 olefin sulfonate	Laneth-5, -15	Dicocodimonium chloride
Sodium deceth sulfate	Montmorillonite	Dihydroxyethyl tallowamine oleate
Sodium laureth-2 sulfate	Myreth-3-octanoate	Dimethicone
Sodium laureth-3 sulfate	Octacosanyl searate	Dimethicone copolyol acetate, D. c. almondate
Sodium laureth-7 sulfate	Oleth-3 phosphate	Dimethicone copolyol amine
Sodium lauriminodipropionate	Oleth-10 phosphate	Dimethicone copolyol bishydroxyethylamine
Sodium lauryl ether sulfosuccinate	Poloxamer 105, 123, 124, 185, 235	Dimethicone copolyol isostearate, D. c. laurate
Sodium lauryl sulfosuccinate	Poloxamer 237, 238, 338, 407	Dimethicone copolyol olive
Sodium magnesium laureth sulfate	Polyethylene	Dimethicone hydroxypropyl trimonium chloride
Sodium myreth sulfate, S. myristyl sulfate	Polyethylene, oxidized	Dimethyl lauramine dimer diisoleate
Sodium tridecyl sulfate	Polyquaternium-31	Dioleylamidoethyl hydroxyethylmonium methosulfate
Sodium tridecyl sulfate	Potassium alginate, P. chloride	Dipalmitoylethyl hydroxyethylmonium methosulfate
TEA-dodecylbenzenesulfonate	Sodium nonoxynol-6 phosphate	Diphenyl dimethicone
TEA-laureth sulfate	Sodium tallowate	Diallowadimonium chloride
TEA-lauroyl collagen amino acids	Synthetic beeswax	N-Dodecyl-N,N-dimethyl-N-(dodecyl acetate) ammonium chloride
TEA-lauroyl keratin amino acids	TEA-acrylates/acrylonitrile copolymer	Eniada phaseoloides extract
TEA-lauryl sulfate	Tribehenin	Ethyl ester of hydrolyzed animal protein
TEA-palm kernel sarcosinate		Gelatin
Wheat germamidopropyl betaine		Ginseng hydroxypropyltrimonium chloride
Yucca vera extract		butylene glycol
		Hematin
		Honey (Mel)
		Hydrolyzed collagen
		Hydrolyzed hair keratin
		Hydrolyzed vegetable protein
		Hydrolyzed wheat protein/dimethicone copolyol acryl copolymer
		Hydrolyzed wheat protein hydroxypropyl polysiloxane
		Hydroxyethyl cerylidimonium phosphate
		Hydroxypropyltrimonium hydrolyzed collagen
		Hydroxypropyl trimonium hydrolyzed wheat protein polysiloxane copolymer
		Hyssop (Hyssopus officinalis) extract
		Inga edulis extract
		Isoctaramidopropylamine oxide
		Isoctaroyl hydrolyzed collagen
		Keratin amino acids
		Kiwi (Actinidia chinensis) fruit extract
		Kola (Cola acuminata) extract
		Laminaria japonica extract
		Laurimonium chloride
		Lauryl hydroxypropyl trimonium polysiloxane copolymer
		Lauryldimethylamine isostearate
		Lauryldimonium hydroxypropyl hydrolyzed collagen
		Lauryldimonium hydroxypropyl hydrolyzed wheat protein
		Linoleamidopropyl dimethylamine dimer diisoleate
		Linoleamidopropyl dimethylamine
		Lysimachia foenum-graecum extract
		Melaleuca hypericifolia extract
		Ocimum santum extract
		Olealkonium chloride

## Functions

Oleyl dimethylamidopropyl cationium citosulfate  
 Palmitamidodecanediol  
 Panthenyl ethyl ether  
 Paulownia imperialis extract  
 Peach (*Prunus persica*) leaf extract  
 PEG-2 cocomonium chloride  
 PEG-120 jojoba acid/alcohol  
 PG-hydroxycellulose lauryldimonium chloride  
 PG-hydroxyethylcellulose cocodimonium chloride  
 PG-hydroxyethylcellulose lauryldimonium chloride  
 PG-hydroxyethylcellulose stearyldimonium chloride  
 Phenyl trimethicone  
 Phospholipids  
 Phytaninol  
 Polyoxyethylene polyoxypropylene glycol  
 Polypropylene glycol  
 Polyquaternium-4, -6, -7, -10  
 Polyquaternium-22, -23, -39  
 PPG-5-cetein-10 phosphate  
 Propyltrimonium hydrolyzed collagen  
 Propyltrimonium hydrolyzed soy protein  
 Propyltrimonium hydrolyzed wheat protein  
 Quaternium-18, -75, -81, -82  
 Quaternium-79 hydrolyzed keratin  
 Quaternium-79 hydrolyzed silk  
 Sambucus nigra extract oil  
 Sesamidopropalkonium chloride  
 Silicone quaternium-1, -8  
 Sodium cocoamphacetate  
 Sodium cocoyl hydrolyzed collagen  
 Sodium polystyrene sulfonate  
 N-Soya-(3-amidopropyl)-N,N-dimethyl-N-ethyl ammonium ethyl sulfate  
 Steapyrium chloride  
 Stearalkonium chloride  
 Stearamidopropyl dimethylamine  
 Steardimonium hydroxypropyl hydrolyzed wheat protein  
 Steartrimonium chloride  
 Steartrimonium hydroxyethyl hydrolyzed collagen  
 N-Stearyl-(3-amidopropyl)-N,N-dimethyl-N-ethyl ammonium ethyl sulfate  
 Stenocalyx micalii extract  
 Sulfur  
 Tallowbenzylidimethylammonium chloride, hydrogenated  
 Tallowirmonium chloride  
 Tea (*Camellia sinensis*) oil  
 TEA-cocoyl hydrolyzed soy protein  
 Thenovl methionate  
 Trimethylsilylamodimethicone  
 Wheat amino acids

Hair set resin polymer

Acrylates/acrylamide copolymer  
 Acrylates/PVP copolymer  
 Acrylates/hydroxyesters acrylates copolymer  
 Acrylates/octylacrylamide copolymer  
 AMP-acrylates copolymer  
 Butylester of PVM-MA copolymer  
 Carboxylated vinylacetate terpolymer  
 Diglycol/CHDM/isophthalates/SDP copolymer  
 Eclipta alba extract  
 Ethyl ester of PVM/MA copolymer  
 Hydroxypropyl chitosan  
 Isopropyl ester of PVM/MA copolymer  
 Octylacrylamide/acrylates/butylaminoethyl methacrylate copolymer  
 Polymethacrylamidopropyltrimonium chloride  
 Polypropylene glycol oligosuccinate  
 PVP  
 PVP/dimethylaminoethylmethacrylate copolymer  
 PVP/Polycarbonyl polyglycol ester  
 PVP/VA copolymer  
 PVP/VA-vinyl propionate copolymer  
 Sodium polyacrylate

VA/butyl maleate/isobornyl acrylate copolymer  
 VA/crotonates/vinyl neodecanoate copolymer  
 VA/crotonates/vinyl propionate copolymer  
 VA/crotonates copolymer  
 Vinyl caprolactam/PVP/  
 dimethylaminoethylmethacrylate copolymer

Hair sheen

Maidenhair fern extract  
 Teurabutoxypropyl methicone

Hair waving

Ammonium thioglycolate, A. thiolactate  
 Argania spinosa oil  
 L-cysteine HCL  
 Cystine  
 Diammonium dithiodiglycolate  
 Dilauryl thiodipropionate  
 Ethanolamine sulfite, E. thioglycolate  
 Ethanolamine thiolactate  
 Glyceryl thioglycolate  
 Hydroxymethyl dioxazabicyclooctane  
 Jojoba esters  
 Monoethanolamine thiolactate  
 Shea butter, ethoxylated  
 Sodium thioglycolate  
 Thioglycerin  
 Thioglycolic acid  
 Thiolactic acid

Humectant

Acetamide MEA  
 Acetyl monoethanolamine  
 6-(N-Acetylaminio)-4-oxahexyltrimonium chloride  
 Adenosine phosphate  
 Ammonium lactate  
 Atelocollagen  
 Calcium pantothenate  
 Calcium stearyl lactylate  
 Carboxymethyl chitin  
 Carboxymethyl chitosan succinamide  
 Chitosan PCA  
 Cholesteryl hydroxystearate  
 Collagen amino-polysiloxane hydrolyzate  
 Colloidal oatmeal  
 Copper PCA methylsilanol  
 Dimethicone copolyol laurate  
 Dipotassium glycyrrhizinate  
 Ethyl ester of hydrolyzed silk  
 Fatty quaternary amine chloride complex  
 Glucose glutamate  
 Glyceth-1,5-lactate  
 Glyceth-7, -12, -26  
 Glycerin  
 Honey extract  
 Hydrogenated passion fruit oil  
 Hydrolyzed casein  
 Hydrolyzed fibronectin  
 Hydrolyzed glycosaminoglycans  
 Hydrolyzed oat protein  
 Hydrolyzed silk  
 Hydrolyzed soy protein  
 Hydroxypropyl chitosan  
 Hydroxypropyltrimonium hydrolyzed casein  
 Hydroxypropyltrimonium hydrolyzed silk  
 Hydroxypropyltrimonium hydrolyzed soy protein  
 Hydroxypropyltrimonium hydrolyzed wheat protein  
 Keratin amino acids  
 Lactamide DGA MEA  
 Lactamidopropyl trimonium chloride  
 Lactic acid  
 Lactose  
 Lauroyl lysine  
 Malitol  
 Mannitol  
 Methyl gluceth-10, -20  
 Natto gum  
 Oat (*Avena sativa*) extract, protein  
 Panthenol

Pantheoyl ethyl ether  
 PCA  
 PEG-4  
 Polyamino sugar condensate  
 Potassium lactate  
 Propylene glycol  
 Propyltrimonium hydrolyzed collagen  
 Propyltrimonium hydrolyzed soy protein  
 Propyltrimonium hydrolyzed wheat protein  
 Quaternium-22  
 Rice (*Oryza sativa*) germ oil  
 Sea Salt (*Maris sal*)  
 Shea butter (*Butyrospermum parkii*)  
 Silk powder  
 Sodium behenyl lactylate  
 Sodium caproyl lactylate  
 Sodium cocoyl lactylate  
 Sodium hyaluronate  
 Sodium isostearyl lactylate  
 Sodium lactate, S. lauroyl lactylate, S. PCA  
 Sodium polyglutamate  
 Sodium stearyl lactylate  
 Sorbitan laurate  
 Sorbitan sesquiosuccinate  
 Sorbitol  
 Sphingolipids  
 TEA-PCA  
 Urea

Hydrotropes

Ammonium cumenesulfonate  
 Ammonium xylenesulfonate  
 Cetamine oxide  
 Cocamidopropylamine oxide  
 Lauramine oxide  
 Potassium toluenesulfonate  
 PPG-2-iodoceteth-4, -6, -9, -12  
 Sodium cumene sulfonate  
 Sodium laureth-13-carboxylate  
 Sodium toluene sulfonate  
 Sodium xylene sulfonate  
 Trideceth-19-carboxylic acid

Intermediate

Caprylic acid  
 Deceth-3  
 Diethyl succinate  
 Dimethylaminopropylamine  
 DM hydantoin  
 Dodecylbenzene sulfonic acid  
 Ethylene dichloride  
 4-Fluoro 3-nitro aniline  
 Lauramine  
 Methyl benzoate, M. cocoate  
 Methyl isostearate, M. laurate  
 Methyl myristate, M. palmitate  
 Oleic acid  
 Ricinoleic acid  
 Tall oil acid  
 Tallow acid

Lathering agent

Ammonium cocoyl sarcosinate  
 Ammonium C12-15 alkyl sulfate  
 Ammonium lauroyl sarcosinate  
 Cocamide MEA, ethoxylate  
 Cocamidopropyl dimethylaminohydroxypropyl hydrolyzed collagen  
 Lauroyl sarcosine  
 Myristoyl sarcosine  
 Sodium cocoyl sarcosinate  
 Sodium lauroyl sarcosinate  
 Sodium methyl cocoyl laurate  
 Sodium myristoyl sarcosinate  
 TEA-cocoyl sarcosinate  
 TEA-lauroyl sarcosinate

Lubricant

Aluminum salt octenyl succinate  
 Amodimethicone

Cosmetic Bench Reference 1996

## Functions

Boron nitride  
Calcium aluminum borosilicate  
Calcium stearate  
Caprylic/capric triglyceride  
Coceth-7 carboxylic acid  
Coconut (Cocos nucifera) oil  
Cyclomethicone  
Diisodecyl adipate  
Diisostearyl fumarate  
Dimethicone copolyol  
Glyceryl isostearate, G. oleate  
Glyceryl polymethacrylate  
Gold of Pleasure oil  
Hyaluronic acid  
Hydrogenated coconut oil  
Hydrogenated cottonseed oil  
Hydrogenated palm oil  
Hydrogenated soybean/cottonseed oil  
Hydrogenated soybean oil  
Hydrogenated vegetable oil  
Hydrolyzed oat flour  
Hydroxypropyl guar  
Isodecyl stearate  
Isopropyl lanolate  
Isostearyl diglyceryl succinate  
Jojoba esters  
Lanolin oil  
Laureth-3 phosphate  
Magnesium myristate, M. stearate  
Mango (Mangifera indica) oil  
Mineral oil (Paraffinum liquidum)  
Mink oil  
Monostearyl citrate  
Neatsfoot oil  
Oleostearine  
Partially hydrogenated soybean oil  
PEG-2 stearate  
PEG-4 dilaurylate  
PEG-5M  
PEG-9M  
PEG-23M  
PEG-27 lanolin  
PEG-30 lanolin  
PEG-40 lanolin, P. stearate  
PEG-45M  
PEG-90M  
PEG-160M  
PEG/PPG-17/6 copolymer  
Pentacrythrityl tetrapelargonate  
Petrolatum  
Phenethyl dimethicone  
Phenyl methicone  
Polyacrylamidomethylpropane sulfonic acid  
Polybutene  
Polydimethicone copolyol  
Polyglycerol ester of mixed vegetable fatty acids  
Polymethylsilsequioxane  
Potassium laurate, P. myristate  
Potassium tallowate  
PPG-2 myristyl ether propionate  
PPG-3 myristyl ether  
PPG-9-buteth-12  
PPG-11 stearyl ether  
PPG-12-buteth-16  
PPG-12-PEG-30 lanolin  
PPG-14 butyl ether  
PPG-20 cetyl ether  
PPG-20-buteth-30  
PPG-24-buteth-27  
PPG-28-buteth-35  
PPG-36 oleate  
PPG-40 butyl ether  
Quaternium-79 hydrolyzed keratin  
Quaternium-79 hydrolyzed silk  
Rice (Oryza sativa) starch  
Shea butter (Butyrospermum parkii) extract  
Shorea stenopetala butter  
Silica  
Stearamide MEA, S. MEA-stearate  
Stearoxytrimethylsilane

Cosmetic Bench Reference 1996

Stearyl dimethicone  
Trisostearyl citrate  
Triolein  
Trisodium HEDTA  
Triundecanoic  
Zinc laurate, Z. stearate

Miscellaneous

Adhesion promoter—Glycerin/diethylene glycol/adipate crosspolymer  
Analgesic—Glycol salicylate  
Anesthetic—Benzocaine  
Anti-elastic—Hydrolyzed Ulva lactuca extract  
Anti-itching—Sodium shale oil sulfonate  
Antiacid—Magnesium hydroxide, Magnesium silicate, Simethicone  
Antifoam—Dimethicone silylate, Simethicone  
Antilipatic—Laminaria saccharina extract  
Antipruritic—Coal tar  
Antispasmodic—Garlic (Allium sativum) extract  
Antiwrinkle—Chinese hibiscus (Hibiscus rosa-sinensis) extract  
Barrier—Glycerin/diethylene glycol/adipate crosspolymer  
Cell regeneration—Glycoproteins, Hydrolyzed Ulva lactuca extract  
Co-emulsifier—Cholesteryl/behnyloctyldodecyl lauroyl glutamate, Isododecane  
Colloid—Gelatin  
Cooling agent—Menthyl PCA, Menthone glycerin acetal  
Deoxygenizer—Clover (Trifolium pratense) extract  
Dye stabilizer—Uric acid  
Filler—Mica  
Fragrance stabilizer—2,2',4,4'-Tetrahydroxybenzophenone  
Free radical scavenger—Melanin  
IR filter—Corallina officinalis

Lanolin substitute—PEG-80 jojoba acid/alcohol  
Lipolytic—Gelidium cartilagineum  
Oxidant—Barium peroxide, Hydrogen peroxide, Urea peroxide  
Oxygen carrier—Perfluorodecylin  
Peroxide stabilizer—Phenacetin, Sodium stannate  
Scalp stimulant—Birch (Betula alba) leaf extract  
Sebostatic—Laminaria saccharina extract  
Shine enhancer—Hydrolyzed wheat protein hydroxypropyl polysiloxane  
Skin barrier lipid—Ceramide 3, N(27-Stearoyloxy-heptacosanoyl) phytosphingosine  
Skin clarifier—Oat (Avena sativa) bran extract  
Skin purifier—Birch (Betula alba) leaf extract  
Substantivity—Dimethicone copolyol bishydroxyethylamine, Dimethicone hydroxypropyl trimonium chloride, Trimethylsilylamodimethicone  
Sunless tanning—Acetyl tyrosine, Eclipta alba extract in white emulsion  
Tonic—Kiwi (Acajia cinensis) fruit extract, Matricaria (Chamomilla recutita) extract, Orange (Citrus aurantium dulcis) peel extract  
Viscosity stabilizer—Diisodecyl adipate  
Spreading agent—Stearyl heptanoate  
Wound healing—Comfrey (Symphytum officinale) leaf extract  
Waterproofing agent—PVP/eicosene copolymer, PVP/hexadecene copolymer, Tricoatanyl PVP

Moisture barrier

Acrylates/octylarylamide copolymer  
Betaglucon  
C16-18 alkyl methicone  
Cholesterol  
Glycolipids  
Isocicosane

# BERNEL

CHEMICAL COMPANY

Up to date, innovative technology for the cosmetic industry has been the driving force behind Bernel Chemical Company since its founding in 1982. Combining over 60 years of cosmetic expertise and marketing knowledge, we have introduced more than 20 raw materials for use by the cosmetic chemist.

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## BERNEL

CHEMICAL COMPANY

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## Functions

Isododecane	Embilica officinalis extract	Methylsilanol elastinate, M. mannuronate
Lanosterol	Embryl minkate	Milk amino acids
Ocetyl pelargonate, O. stearate	Eugenia jambolana extract	Mineral oil (Paraffinum liquidum)
Polyisobutene	Evening primrose (Oenothera biennis) extract, oil	Molybdenum aspartate
Polyisobutene/isohexapentacontahexane	Galla sinensis extract	Mouriri spiranga extract
Polyisobutene/isooctahexacontane	Ganoderma lucidum oil	Natto gum
Silica silylate	Ginseng (Panax ginseng) extract	Nelumbium speciosum extract
Trihydroxypalmitamidohydroxy propyl myristyl ether	Gleditsia sinensis extract	Neopentyl glycol dicaprate
Trimethylsiloxysilicate	Glycereth-12	Oat (Avena sativa) protein
	Glycerol alginate, G. collagenate	Ocetyl hydroxystearate
	Glyceryl polymethacrylate	Ophiopogon japonicus extract
	Glycolic acid	Orange (Citrus aurantium dulcis) peel wax
	Glycolipids	Palmitic extract
	Glycosaminoglycans	Pantethine
	Glycosphingolipids	Panthenyl ethyl ether
	Gnetum amazonicum extract	Paraffin
	Grape (Vitis vinifera) seed oil	Partially hydrogenated soybean oil
	Hazel (Corylus avellana) nut oil	Peanut (Arachis hypogaea) oil
	Honey extract	Pecan (Carya illinoensis) oil
	Hyaluronic acid	PEG-4, -6, -8, -12
	Hybrid safflower (Carthamus tinctorius) oil	PEG-70 mango glycerides
	Hydrogenated castor oil	PEG-75 shea butter glycerides
	Hydrogenated coconut oil	PEG-75 shorea butter glycerides
	Hydrogenated cottonseed oil	PEG-100 stearate
	Hydrogenated lecithin	Pentaerythrityl isostearate/caprate/caprylate/adipate
	Hydrogenated palm oil	Pentaerythrityl stearate/caprate/caprylate/adipate
	Hydrogenated polyisobutene	Pentylene glycol
	Hydrogenated soybean oil	Perfluoropolyethylisopropyl ether
	Hydrogenated soybean/cottonseed oil	Petrolatum
	Hydrogenated vegetable oil	Petroleum wax
	Hydrolyzed carbolipoprotein	Pfaffia spp. extract
	Hydrolyzed collagen	Pistachio (Pistacia vera) nut oil
	Hydrolyzed elastin	Placental protein
	Hydrolyzed fibronection	Plankton extract
	Hydrolyzed glycosaminoglycans	Polyamino sugar condensate
	Hydrolyzed keratin	Polybutene
	Hydrolyzed milk protein	Polyunsaturated fatty acids
	Hydrolyzed oats	Potassium DNA, P. lactate, P. PCA
	Hydrolyzed pea protein	PPG-8/SMDI copolymer
	Hydrolyzed placental protein	PPG-20 methyl glucose ether distearate
	Hydrolyzed rice protein	Propylene glycol dicaprylate/dicaprate
	Hydrolyzed transgenic collagen	Propylene glycol diacetate
	Hydrolyzed serum protein	Pumpkin (Cucurbita pepo) seed oil
	Hydrolyzed silk	Quinoa (Chenopodium quinoa) extract
	Hydrolyzed sweet almond protein	Rapeseed (Brassica campestris) oil
	Hydrolyzed wheat protein	Rehmannia chinensis extract
	Hydroxyethyl chitosan	Rice (Oryza sativa) bran oil
	Inositol	Rose Water
	Isodecyl salicylate	Royal jelly extract
	Isostearyl hydrolyzed animal protein	Saccharide isomerate
	Jajoba (Buxus chinensis) oil	Saccharomyces lysate extract
	Jajoba esters	Saccharomyces/soy protein ferment
	Keratin amino acids	Safflower (Carthamus tinctorius) oil
	Kiwi (Actinidia chinensis) fruit extract	Selenium aspartate, S. protein complex
	Kola (Cola acuminata) extract	Sericin
	Kukui (Aleurites moluccana) nut oil	Serum albumin
	Lactamide DGA, L. MEA	Sesame (Sesamum indicum) oil
	Lactic acid	Shea butter (Butyrospermum parkii)
	Lactobacillus/whey ferment	Shea butter (Butyrospermum parkii) extract
	Lactococcus hydrolysate	Shorea stenoptera butter
	Lactoyl methylsilanol elastinate	Silk amino acids
	Linolol alcohol	Sodium carboxymethyl beta-glucan
	Lauryl PCA	Sodium chondroitin sulfate
	Lecithin	Sodium DNA, S. hyaluronate
	Lesquerella fendleri oil	Sodium lactate, S. PCA
	Liposomes	Soluble collagen
	Lysine PCA	Soluble transgenic elastin
	Macadamia ternifolia nut oil	Soybean (Glycine soja) oil
	Magnesium aspartate	Spherical cellulose acetate
	Mallitol	Spondias amara extract
	Manganese aspartate	Squalene
	Mango (Mangifera indica) oil	Stomach extract
	Mannan	Sunflower (Helianthus annuus) seed oil
	Marine polyaminosaccharide	Superoxide dismutase
	Mauritella armata extract	Tissue extract
	Maximilliana regia extract	Tocopheryl acetate, T. linoleate
	Meadowfoam (Limnanthes alba) seed oil	Tomato (Solanum lycopersicum) extract
	Melaleuca hypericifolia extract	

Cosmetic Bench Reference 1996

## Functions

Tormentil (*Potentilla erecta*) extract  
Trehalose  
Triundecanoin  
Vegetable oil  
Walnut (*Juglans regia*) oil  
Watercress (*Nasturtium officinale*) extract  
Wheat (*Triticum vulgare*) germ extract, germ oil  
Yarrow (*Achillea millefolium*) extract  
Wheat amino acids  
Yeast (*Saccharomyces cerevisiae*) extract (Faex)  
Yogurt filtrate  
Zinc aspartate  
Ziziphus jujuba extract

**Naturalizer**

2-Aminobutanol  
Aminomethyl propanediol  
Aminomethyl propanediol  
Aminomethyl propanol  
Ammonium carbonate  
Calcium hydroxide  
Diethanolamine  
Ethanolamine  
Glucamine  
Isopropanolamine  
Isopropylamine  
2-Methyl-4-hydroxypyrrolidine  
Morpholine  
Sodium bromate  
Succinic acid  
Tetrahydroxypropyl ethylenediamine  
Triethanolamine  
Tromethamine

**Oil absorbent**

Hydrated silica  
Polymethyl methacrylate  
Silicon dioxide hydrate  
Walnut (*Juglans regia*) shell powder

**Ointment base**

Borage (*Borago officinalis*) seed oil  
Caprylic/capric/stearic triglyceride  
Glyceryl cocoate  
Hydrogenated coco-glycerides  
Lanolin  
Mink oil  
Oleostearine  
Tallow

**Opacifier**

Banum sulfate  
C12-16 alcohols  
Cetearyl octanoate  
Cetyl myristate, C. palmitate  
Cocamidopropyl lauryl ether  
Glyceryl distearate  
Glyceryl hydroxystearate  
Glyceryl myristate, G. stearate  
Glycol distearate, G. stearate  
Magnesium myristate  
PEG-2 distearate, P. stearate  
PEG-2 stearate SE  
PEG-3 distearate  
Propylene glycol myristate, P. g. stearate  
Stearamide  
Stearamide DIBA-stearate  
Stearamide MEA  
Stearamide MEA-stearate  
Stearamidopropyl dimethylamine lactate

Stearyl stearate  
Styrene homopolymer  
Styrene/acrylates copolymer  
Styrene/PVP copolymer  
Trisoneann PEG-6 esters

**Plasticizer**

Acetyl tributyl citrate  
Acetyl triethyl citrate  
AMP-isostearoyl hydrolyzed wheat protein  
AMPD-isostearoyl hydrolyzed collagen  
Cyclohexane dimethanol dibenzoate  
Dibutyl phthalate  
Diethyl phthalate  
Diethylene glycol dibenzoate  
Diisopropyl sebacate  
Dimethicone copolyol  
Dimethyl phthalate  
Dipropylene glycol dibenzoate  
Ethyl ester of hydrolyzed keratin  
Glyceryl trimbenzoate  
Glycol  
Hydrolyzed serum protein  
Isocetyl salicylate  
Isodecyl benzoate  
Isocicosane  
Isopropyl lanolate  
Isostearoyl hydrolyzed collagen  
Lauryl hydrolyzed collagen  
Marine collagen  
Monostearyl citrate  
Neopenyl glycol dibenzoate  
Octyl benzoate, O. laurate  
PEG-60 Shea butter glycerides  
Pentaerythrityl tetra benzoate  
Polyoxyethylene glycol dibenzoate  
Polypropylene glycol dibenzoate  
PPG-12-PEG-50 lanolin  
PPG-20 cetyl ether  
PPG-20 lanolin alcohol ether  
Propylene glycol dibenzoate  
Propylene glycol myristyl ether acetate  
Rice (*Oryza sativa*) bran wax  
Serum protein  
Tosylamide/epoxy resin  
Triacetin  
Tributyl citrate  
Triethyl citrate  
Trimethyl pentanediol dibenzoate  
Trimethylhexanetri benzoate

**Polish**

Acrylates copolymer  
Aluminum silicate  
Neasfoot oil  
Tallow

**Polymer**

Acrylamide sodium acrylate copolymer  
Acrylates-VA crosspolymer  
Acrylates/acrylamide copolymer  
Acrylates/hydroxyesters acrylates copolymer  
Acrylates/octylacrylamide copolymer  
Acrylates/steareth-20 methacrylate copolymer  
Adipic acid-epoxypropyl diethylenetriamine copolymer  
Adipic acid/dimethylamino hydroxypropyl diethylene triamine copolymer  
Ammonium acrylates copolymer

Ammonium acrylates/acrylonitrile copolymer  
AMP-acrylates copolymer  
AMP-isostearoyl hydrolyzed collagen  
Butylester of PVM-MA copolymer  
Calcium cartagenan  
Carboxylated vinylacetate terpolymer  
Ceteareth-2 phosphate  
Ceteareth-5 phosphate  
Ceteareth-10 phosphate  
Ceteareth-29, -34  
Coco-glucoside  
Cocodimonium hydroxypropyloxyethyl cellulose  
C12-13 pareth-4, -9, -23  
DEA-ceteareth-2-phosphate  
DEA-oleth-5-phosphate  
DEA-oleth-10-phosphate  
Diglyco/CHDM/isophthalates/SIP copolymer  
Diisopropyl dimer diinoleate  
Diisostearoyl trimethylolpropane siloxy silicate  
Diisostearyl dimer diinoleate  
Dilinoleic acid  
Dodecanedioic acid/cetearyl alcohol/glycol copolymer  
Eclipta alba extract  
Ethyl ester of PVM/MA copolymer  
Ethylene/acrylic acid copolymer  
Ethylene/VA copolymer  
Glycereth-26 phosphate  
Hyaluronic acid  
Hydrolyzed RNA  
Hydrolyzed wheat protein polysiloxane polymer  
Hydroxypropyltrimonium hydrolyzed collagen  
Hydroxypropyltrimonium hydrolyzed wheat protein  
Laneth-40  
Laurylidimonium hydroxypropyl hydrolyzed soy protein  
Methacryloyl ethyl betaine/acrylates copolymer  
Octylacrylamide/acrylates/butylaminooctyl methacrylate copolymer  
Oleth-2 phosphate  
Oleth-5 phosphate  
PEG-3 lanolate  
PEG-4 stearate  
PEG-5M  
PEG-7 glyceryl cocoate  
PEG-8 glyceryl laurate  
PEG-8/SMDI copolymer  
PEG-9 castor oil  
PEG-9M  
PEG-11 babassu glycerides  
PEG-12 palm kernel glycerides  
PEG-12 stearate  
PEG-14 avocado glycerides  
PEG-15 glyceryl laurate  
PEG-20 corn glycerides  
PEG-20 evening primrose glycerides  
PEG-20 glyceryl oleate  
PEG-23 oleate  
PEG-23M  
PEG-29 castor oil  
PEG-42 babassu glycerides  
PEG-45 safflower glycerides  
PEG-45M  
PEG-60 evening primrose glycerides  
PEG-60 hydrogenated castor oil  
PEG-75 castor oil  
PEG-90M  
PEG-120 distearate

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## Functions

PEG-150 lanolin  
 PEG-160M  
 PG-hydroxyethylcellulose lauryldimonium chloride  
 PG-hydroxyethylcellulose cocodimonium chloride  
 PG-hydroxyethylcellulose stearylmonium chloride  
 Polyethylene, ionomer  
 Polyethylene, micronized  
 Polyethylene, oxidized  
 Polyglyceryl-2 polyhydroxystearate  
 Polymethacrylamidopropyltrimonium chloride  
 Polyquaternium-6, -7, -10, -11, -22, -39  
 Polysilicone-8  
 Potassium alginate  
 Potassium lauroyl collagen amino acids  
 Potassium lauroyl hydrolyzed soy protein  
 Potassium lauroyl wheat amino acids  
 PPG-8/SMDI copolymer  
 PPG-12/SMDI copolymer  
 PPG-51/SMDI copolymer  
 PVM/MA decadiene crosspolymer  
 PVP/dimethylaminoethylmethacrylate copolymer  
 PVP/VA copolymer  
 Sodium cocoyl hydrolyzed wheat protein  
 Steardimonium hydroxypropyl hydrolyzed wheat protein  
 Steareth-2 phosphate  
 TEA-acrylates/acrylonitril copolymer  
 Tosylamide/epoxy resin  
 Tosylamide/formaldehyde resin  
 Trideceth-5, -6, -7, -8  
 VA/butyl maleate/isobornyl acrylate copolymer  
 VA/crotonate/vinyl neodecanoate copolymer  
 Vinyl caprolactam/PVP/  
 dimethylaminoethylmethacrylate copolymer  
 Wheat (Triticum vulgare) protein  
 Xanthan gum

**Powder**  
 Acrylates copolymer, spherical powder  
 Attapulgit  
 Boron nitride  
 Calcium aluminum borosilicate  
 Calcium carbonate  
 Cellulose triacetate  
 Corn (Zea mays) cob powder, starch  
 Hydrogenated jojoba wax  
 Magnesium carbonate, M. myristate  
 Magnesium stearate  
 Mica  
 Microcrystalline cellulose  
 Nylon-6  
 Nylon powder  
 Oat (Avena sativa) starch  
 Polyamide 12  
 Polyethylene  
 Polymethyl methacrylate  
 Polymethylsilsesquioxane  
 PTFE  
 Silica  
 Silk powder  
 Spherical cellulose acetate  
 Talc  
 Tapioca dextrin  
 Zinc laurate

**Powder, absorbent**  
 Aluminum starch octenylsuccinate  
 Clays (white, yellow, red, green, pink)  
 Sorbitol  
 Tapioca

**Preservative**  
 Alcohol  
 Ascorbic acid  
 Ascorbyl palmitate

Benzalkonium chloride  
 Benzethonium chloride  
 Benzoic acid  
 Benzyl alcohol  
 Benzylparaben  
 5-Bromo-5-nitro-1,3-dioxane  
 2-Bromo-2-nitropropane-1,3-diol  
 Butylparaben  
 Calcium propionate  
 Ceriumium bromide  
 Cetyl pyridinium chloride  
 Chloroxylenol  
 Chlorophresin  
 o-Cymen-5-ol  
 Diazolidinyl urea  
 Dichlorobenzyl alcohol  
 Dichlorophene  
 Diiodomethylolylsulfone  
 Dimethyl hydroxymethyl pyrazole  
 Dimethyl oxazolidine  
 Disodium EDTA  
 DMDM hydantoin  
 EDTA  
 Erythorbic acid  
 7-Ethylbicyclooxazolidine  
 Ethylparaben  
 Fomistopsis officinalis oil  
 Formaldehyde  
 Glucal  
 Glyceryl laurate  
 HEDTA  
 Hexamidine diisethionate  
 Hexidine  
 Imidazolidinyl urea  
 Isobutylparaben  
 Isopropyl sorbate  
 Isopropylparaben  
 MDM hydantoin  
 Methoxammonium chloride  
 Methyl paraben sodium  
 Methylchloroisothiazolinone  
 Methyltribromo glutaronitrile  
 Methylisothiazolinone  
 Methylparaben  
 Mushroom (Cordyceps sabolifera) extract  
 Myristonium bromide  
 Pentasodium pentetate  
 Pentaic acid  
 Phenethyl alcohol  
 Phenol  
 Phenyl mercuric acetate  
 o-Phenylphenol  
 Polyaminopropyl biguanide  
 Polymethoxy bicyclic oxazolidine  
 Potassium sorbate  
 Propylparaben  
 Quaternium-15  
 Salicylic acid  
 Sodium benzoate, S. bisulfate  
 Sodium butylparaben, S. dehydroacetate  
 Sodium erythorbate, S. ethyl paraben  
 Sodium hydroxymethylglycinate  
 Sodium metabisulfite, S. methylparaben  
 Sodium o-phenylphenate  
 Sodium propionate, S. propylparaben  
 Sodium pyrimithione, S. salicylate  
 Sodium sulfite  
 Sorbic acid  
 Tetrasodium EDTA  
 Thimerosal  
 Thymol  
 Tris (hydroxymethyl) nitromethane  
 Trisodium EDTA, T. HEDTA  
 Usnic acid  
 Zinc PCA

**Propellant**  
 Butane  
 Dimethyl ether  
 Hydrofluorocarbon 152a

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## Functions

Isobutane  
Propane

**Protein**

Albumen  
Atelocollagen  
Bletia hydrotinina extract  
Chrysanthemum monfolium extract  
Cocodimonium hydroxypropyl hydrolyzed collagen  
Cocodimonium hydroxypropyl hydrolyzed keratin  
Cocodimonium hydroxypropyl hydrolyzed soy protein  
Cocodimonium hydroxypropyl hydrolyzed wheat protein  
Cocoyl hydrolyzed collagen  
Collagen, C. phthalate  
Collagen amino-polysiloxane hydrolyzate  
Deoxyribonucleic acid  
Desamido collagen  
Elastin amino acids  
Embryo extract  
Ethyl ester of hydrolyzed animal protein  
Fibrinectin  
Gelatin  
Human placental protein  
Hydrolyzed collagen  
Hydrolyzed extensin  
Hydrolyzed fish protein  
Hydrolyzed hemoglobin  
Hydrolyzed keratin  
Hydrolyzed lactalbumin  
Hydrolyzed milk protein  
Hydrolyzed soy flour  
Hydrolyzed sweet almond protein  
Hydroxypropyltrimonium hydrolyzed collagen  
Isostearyl hydrolyzed collagen  
Keratin  
Lactoferrin  
Lactoglobulin  
Lauryldimonium hydroxypropyl hydrolyzed collagen  
Marine collagen  
Methylsilanol elastinate  
Potassium abietoyl hydrolyzed collagen  
Potassium cocoyl hydrolyzed collagen  
Potassium myristoyl hydrolyzed collagen  
Potassium oleoyl hydrolyzed collagen  
Potassium undecylenoyl hydrolyzed collagen  
Propyltrimonium hydrolyzed collagen  
Propyltrimonium hydrolyzed soy protein  
Propyltrimonium hydrolyzed wheat protein  
Protein hydrovisates  
Quaternium-79 hydrolyzed keratin  
Quaternium-79 hydrolyzed silk  
Rice peptide  
RNA  
Serum albumin, S. protein  
Silk powder

Sodium caseinate  
Sodium cocoyl hydrolyzed collagen  
Sodium cocoyl hydrolyzed soy protein  
Sodium myristoyl hydrolyzed collagen  
Sodium oleoyl hydrolyzed collagen  
Sodium stearoyl hydrolyzed collagen  
Sodium undecylenoyl hydrolyzed collagen  
Sodium/TEA-lauroyl hydrolyzed collagen  
Sodium/TEA-lauroyl hydrolyzed keratin  
Soluble collagen  
Soluble keratin  
Soluble wheat protein  
Soy (Glycine soja) protein  
Szeandimonium hydroxypropyl hydrolyzed collagen  
Szeantimonium hydroxyethyl hydrolyzed collagen  
TEA-cocoyl hydrolyzed collagen  
TEA-cocoyl hydrolyzed soy protein  
TEA-lauroyl collagen amino acids  
TEA-lauroyl keratin amino acids  
Trachea hydrolyzate  
Triethonium hydrolyzed collagen ethosulfate  
Wheat (Triticum vulgare) germ extract, protein  
Wheat amino acids  
Wheat peptide  
Wheat protein

**Protein, hydrolyzed**

Ethyl ester of hydrolyzed silk  
Hydrolyzed casein  
Hydrolyzed elastin  
Hydrolyzed mushroom (Tricholoma matsutake) extract  
Hydrolyzed pea protein  
Hydrolyzed rice protein  
Hydrolyzed serum protein  
Hydrolyzed silk  
Hydrolyzed soy protein  
Hydrolyzed vegetable protein  
Hydrolyzed wheat protein  
Hydroxypropyltrimonium hydrolyzed casein  
Hydroxypropyltrimonium hydrolyzed silk  
Hydroxypropyltrimonium hydrolyzed soy protein  
Hydroxypropyltrimonium hydrolyzed wheat protein

**Reducing agent**

Dimynslyl thiodipropionate  
Hydrolyzed zein, iodized  
Hydrolyzed zein, sulfonized  
Zinc formaldehyde sulfoxylate

**Refatting agent**

Caprylic/capric triglyceride PEG-4 esters  
Cocamide MIPA  
Diisostearyl dimer dilinoleate  
Hydrogenated palm kernel glycerides  
Isostearyl erucate, L. isostearate  
Lecithin

Liposomes  
Magnesium sulfate hepta-hydrate  
Octyldodecyl behenate, O. myristate  
bis-Octyldodecyl stearoyl dimer dilinoleate  
Octyldodecyl stearoyl stearate  
Octyl hydroxystearate  
PEG-3 stearate  
PEG-4 oleamide  
PEG-6 capric/caprylic glycerides  
PEG-7 glyceryl cocoate  
PEG-16  
Propylene glycol dipelargonate

**Resin**

Acrylates/hydroxyesters acrylates copolymer  
Ethylene vinyl acetate  
Glyceryl abietate  
Methacryloyl ethyl betaine/acrylates copolymer  
4-Methyl benzenesulfonamide  
Polypropylene  
Polyquaternium-16, -14  
Sucrose benzoate

**Sequestrant**

Calcium acetate, C. phosphate, C. sulfate  
Encapsulation and entrapment systems  
Pentasodium triphosphate  
Phosphoric acid  
Potassium phosphate, P. sodium tartrate  
Silicon dioxide hydrate  
Sodium citrate, S. gluconate  
Sorbitol  
Tartaric acid  
Tripotassium EDTA  
Trisodium NTA

**Silicone**

Amino bispropyl dimethicone  
Ammonium dimethicone copolyol sulfate  
Amodimethicone  
Behenoxy dimethicone  
C16-18 alkyl methicone  
Cetyl dimethicone copolyol  
Cyclomethicone Diisostearyl trimethylolpropane siloxy silicate  
Diisododecyl adipate  
Diisostearyl trimethylolpropane siloxy silicate  
Dimethicone  
Dimethicone copolyol  
Dimethicone copolyol almondate  
Dimethicone copolyol isostearate  
Dimethicone copolyol olive, D. c. phthalate  
Dimethicone copolyolamine  
Dimethiconol fluoroalcohol dilinoleic acid  
Dimethiconol hydroxystearate, D. stearate  
Diphenyl dimethicone  
Disodium-PC-propyldimethicone thiosulfate  
Isopropyl hydroxybutyramide dimethicone copolyol  
Methicone

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**Proteins**

**Hydrocoll, Solu-Soy, Wheat-Pro**



## Functions

Octamethyl cyclotrisiloxane  
Phenyl methicone, P. trimethicone  
Polyether Trisiloxane  
Polymethylsilbesquioxane  
Polysilicone-8  
Quaternium-80  
Silicone quaternium-1, -8  
Sodium-PG-propyl thiosulfate dimethicone  
Stearoxymethicone/dimethicone copolymer  
Trimethylsilylamodimethicone

Skin calming agent

Cornflower (*Centaurea cyanus*) extract  
Fennel (*Foeniculum vulgare*) extract  
Fenugreek extract  
Linden (*Tilia cordata*) extract  
Valerian (*Valeriana officinalis*) extract

Skin cleanser

Dog rose (*Rosa canina*) hips extract  
Papaya (*Carica papaya*) extract  
Peach (*Prunus persica*) extract  
Rose (*Rosa multiflora*) extract  
Willow (*Salix alba*) extract

Skin conditioner

Anemisia apiacea extract  
Astrocaryum iucuma extract  
Bactris gasipaes extract  
Bidin  
Bishydroxyethyl biscetyl malonamide  
Bleita hyacinthina extract  
Borage (*Borago officinalis*) seed oil  
Boragamidopropyl phosphatidyl PG-dimonium chloride  
Carbocysteine  
Catalpa kaempferia extract  
Coco phosphatidyl PG-dimonium chloride  
Cocodimonium hydroxypropyl hydrolyzed keratin  
Collagen amino acids  
Cyclomethicone  
Dimethicone, D. copolyol acetate  
Embilica officinalis extract  
Equisetum arvense extract  
Ethyl ester of hydrolyzed animal protein  
Evening primrose (*Oenothera biennis*) oil  
Fomes fomentarius extract  
Fomistopsis officinalis oil  
Gelatin  
Ginseng hydroxypropyltrimonium chloride  
butylene glycol  
Glycolipids  
Glycosphingolipids  
Gnetum amazonicum extract  
Honey (Mel)  
Hydrolyzed carbolipoprotein  
Hydrolyzed elastin  
Hydrolyzed pea protein  
Hydrolyzed rice protein  
Hydrolyzed serum protein  
Hydrolyzed silk  
Hydrolyzed soy protein  
Hydrolyzed vegetable protein  
Hydrolyzed wheat protein  
Inga edulis extract  
Kiwi (*Actinidia chinensis*) fruit extract  
Laminaria japonica extract  
Lecithin  
Marsilea minuta extract  
Nettle (*Urtica dioica*) extract  
Palmitamidododecanediol  
Pearls (*Margarita margarita*)  
PEG-42 Ebrinko ceramides extract  
Phenyl trimethicone  
Phytantriol  
Polygonum multiflorum extract  
Polyquaternium-1, -2, -3  
Polyquaternium-15

Potassium cocoyl hydrolyzed collagen  
Retinyl palmitate polypeptide  
Salvia miltiorrhiza extract  
Sili  
Sodium cocoyl hydrolyzed collagen  
Soluble transgenic elastin  
Steatrimonium hydroxyethyl hydrolyzed collagen  
Stearyl methicone

Skin healing

Calendula officinalis extract  
Glycoproteins  
Hydrocortyl (*Centiella asiatica*) extract  
Oat (*Avena sativa*) extract  
Sandalwood (*Santalum album*) extract  
Spearmin (*Mentha viridis*) extract

Skin lightening/whitening agent

Ascorbic acid polypeptide  
Bearberry (*Arctostaphylos uva-ursi*) extract  
Hydroquinone-beta-D-glucopyranoside  
Lemon (*Citrus medica limonum*) peel extract  
Pearls (*Margarita margarita*)

Skin protectant

Acetylmethylonyl methylsilanol elastinate  
Allantoin, A. aluminum hydroxide  
Aloe barbadensis, A. b. extract  
Aluminum starch octenylsuccinate  
Anise (*Pimpinella anisum*) extract  
Arnica montana extract  
Anemisia apiacea extract  
Ascorbyl methylsilanol pectinate  
Astrocaryum iucuma extract  
Bactris gasipaes extract  
Betaglucan  
Bishydroxyethyl biscetyl malonamide  
Bleita hyacinthina extract  
C 18-70 Isoparaffin  
Calendula amurensis extract  
Carboxymethyl chitin  
Cardinia cambogia extract  
Carrot (*Daucus carota*) extract  
Carrot (*Daucus carota sativa*) oil  
Catalpa kaempferia extract  
Chenopodium album extract  
Chitosan  
Chrysanthemum morifolium extract  
Collagen  
Corn poppy (*Papaver rhoeas*) extract  
Crataegus cuneata extract  
Crataegus monogyna extract  
Cypress (*Cupressus sempervirens*) extract  
Dimethicone  
Dimethiconol fluoroalcohol dilinoleic acid  
Dimethiconol hydroxystearate, D. stearate  
Dimethylsilanol hyaluronate  
Echitea glauca extract  
Embryo extract  
Entada phaseoloides extract  
Equisetum arvense extract  
Euphorium fortunei extract  
Euterpe precatoria extract  
Fenugreek extract  
Fomistopsis officinalis oil, F. pinicola extract  
Galla sineasis extract  
Gentian (*Gentiana lutea*) extract  
Gleditsia sinensis extract  
Glycerol ricinoleate  
Glycolipids  
Hierochloa odorata extract  
Hyaluronic acid  
Hydrogenated lecithin  
Hydrolyzed lupine protein  
Hydrolyzed milk protein  
Hydrolyzed mushroom (*Tricholoma matsutake*) extract  
Indian cross (*Trinacrum maris*) extract

Isodecyl salicylate  
Jojoba (*Buxus chinensis*) oil  
Lady's Thistle (*Silybum marianum*) extract  
Laminaria japonica extract  
Ligusticum jeholense extract  
Liposomes  
Magnolia spp. extract  
Mango kernel oil  
Marsilea minuta extract  
Melaleuca hypericifolia extract  
Melaleuca ucinata extract  
Melaleuca wilsonii extract  
Methylsilanol tri PEG-8 glyceryl cocoate  
Oat (*Avena sativa*) meal  
Oyster (*Osireca*) shell extract  
Palmitamidododecanediol  
Pearls (*Margarita margarita*)  
Pentahydroxysqualene  
Perfluorodecyl  
Perfluoropolyethylisopropyl ether  
Petrolatum  
PEG-8/SMDI copolymer  
PEG-42 Ebrinko ceramides extract  
Pfaffia spp. extract  
Phospholipids  
Plankton extract  
Polygonum multiflorum extract  
Pongamol  
PPG-12/SMDI Copolymer  
PPG-5/SMDI Copolymer  
Propyltrimonium hydrolyzed collagen  
Quinoa (*Chenopodium quinoa*) extract, oil  
Salvia miltiorrhiza extract  
Sambucus nigra extract  
Shark liver oil  
Shorea robusta extract  
Sodium chondroitin sulfate  
Soluble transgenic elastin  
Steatrimonium hydroxyethyl hydrolyzed collagen  
Sterculia platensis extract  
Superoxide dismutase  
Trachea hydrolysate  
Wheat (*Triticum vulgare*) germ extract, protein  
White nettle (*Lamium album*) extract  
Withania somniferum extract  
Xanthoxylum bungeanum extract  
Zinc oxide

Skin smoothing agent

Althea officinalis extract  
Coltsfoot (*Tussilago farfara*) leaf extract  
Comfrey (*Symphytum officinale*) leaf extract  
Plantain (*Plantago major*) extract  
Sericin

Skin softening

Clays (white, yellow, red, green, pink)  
Cucumber (*Cucumis sativus*) extract  
Kelp (*Macrocystis pyrifera*) extract  
Peach (*Prunus persica*) extract  
Phenethyl dimethicone

Skin soothing

Calendula officinalis extract  
Cherry bark extract  
Cucumber (*Cucumis sativus*) extract  
Garlic (*Allium sativum*) extract  
Hyssop (*Hyssopus officinalis*) extract  
Jasmine (*Jasminum officinale*) extract  
Kelp (*Macrocystis pyrifera*) extract  
Mango kernel oil  
Meadowsweet (*Spiraea ulmaria*) extract  
Quince (*Pyrus cydonia*) seed extract  
Slippery elm extract  
Valerian (*Valeriana officinalis*) extract  
Willow (*Salix alba*) extract  
Witch hazel (*Hamamelis virginiana*) extract  
Yarnwa (*Achillea millefolium*) extract

## Functions

**Solubilizer**

Acetyl monomethanolamine  
Almond oil PEG-6 esters  
2-Aminobutanol  
Aminomethyl propanediol  
Aminomethyl propanediol, A. propanol  
Apricot kernel oil PEG-6 esters  
Benzalkonium chloride  
Butoxydiglycol  
Butyl glucoside  
Butylene glycol  
Butylhexanol  
Capric-caprylic mono-diglyceride  
Capryl caprylyl glucoside  
Caprylic-capric triglyceride  
Caprylic-capric/linoleic triglyceride  
Caprylic-capric/oleic triglycerides  
Caprylyl-capryl glucoside  
Cetareth-20  
Ceteth-10  
Cetyl PPG-2 isodeceth-7 carboxylate  
Cholesterol  
Corn oil PEG-6 esters  
Decaglycerol monooleate  
Diethanolamine  
Dilaureth-10 phosphate  
Dimethyl octylnediol  
Dioleth-8 phosphate  
Glyceth-7-26  
Glyceryl caprylate, G. dilaurate  
Glyceryl caprylate/caprate  
Isoeicosane  
Isopropanolamine  
Isosteareth-20  
Laneth-5, -15  
Laureth-23  
Methylated cyclodextrin  
Myreth-3  
Myreth-3-octanoate  
Nonoxynol-10, -12, -14, -40, -50  
Octoxynol-11, -40  
Oleamphosphorylpropylsulfonate  
Oleth-3, -5, -10, -15, -20, -25, -50  
Oleth-20 phosphate  
PEG-4, -6, -8, -12, -16, -20, -32, -40  
PEG-4 dilaurate  
PEG-6 capric/caprylic glycerides  
PEG-6 methyl ether  
PEG-8 distearate  
PEG-12 laurate

PEG-15 castor oil  
PEG-18 stearate  
PEG-20 glyceryl isostearate, P. g. laurate  
PEG-20 glyceryl oleate, P. g. stearate  
PEG-20 methyl glucose sesquisteate  
PEG-20 sorbitan isostearate  
PEG-20 sorbitan triisostearate  
PEG-24 hydrogenated lanolin  
PEG-25 castor oil  
PEG-25 hydrogenated castor oil  
PEG-30 castor oil  
PEG-30 glyceryl cocoate  
PEG-30 glyceryl isostearate  
PEG-30 glyceryl laurate  
PEG-30 glyceryl oleate  
PEG-30 glyceryl stearate  
PEG-33 castor oil  
PEG-35 castor oil  
PEG-36 castor oil  
PEG-40 castor oil  
PEG-40 glyceryl laurate, P. g. stearate  
PEG-40 hydrogenated castor oil  
PEG-40 hydrogenated castor oil PCA isostearate  
PEG-40 sorbitan diisostearate  
PEG-45 palm kernel glycerides  
PEG-48 hydrogenated castor oil  
PEG-50 castor oil  
PEG-50 hydrogenated castor oil  
PEG-60 almond glycerides  
PEG-60 castor oil  
PEG-60 corn glycerides  
PEG-60 glyceryl isostearate, P. g. stearate  
PEG-60 hydrogenated castor oil  
PEG-60 lanolin  
PEG-70 mango glycerides  
PEG-75 lanolin  
PEG-75 shea butter glycerides  
PEG-75 shorea butter glycerides  
PEG-80 hydrogenated castor oil  
PEG-80 jojoba acid/alcohol  
PEG-80 sorbitan laurate  
PEG-100 castor oil  
PEG-100 hydrogenated castor oil  
PEG-120 jojoba acid/alcohol  
PEG-200 trihydroxystearin  
Poloxamer 407  
Polyglyceryl-3 oleate  
Polyglyceryl-6 dioleate  
Polyglyceryl-10 decaoleate, P. tetraoleate  
Polysorbate 20, 60, 80  
PPG-2-isodeceth-4, -6, -9, -12

PPG-3 isosteareth-9  
PPG-3 isoceteth-20 acetate  
PPG-5-ceteth-10 phosphate  
PPG-5-ceteth-20  
PPG-6-decyltetradeceth-12, -20, -30  
PPG-12-PEG-65 lanolin oil  
PPG-15 stearyl ether  
PPG-18 butyl ether  
PPG-24 butyl ether  
PPG-26-buteth-26  
PPG-33 butyl ether  
PPG-33-buteth-45  
PPG-40-PEG-60 lanolin oil  
PPG-50 cetyl ether  
Propylene glycol dicaprylate, dicaprylate/  
dicaprate  
Ricinoleamide DEA  
Ricinoleth-40  
Sodium alpha olefin sulfonate  
Sodium lauryl sulfate  
Sodium methylnaphthalenesulfonate  
Trichanolamine  
Triocanoil  
Tromethamine

**Solvent**

Acetic acid  
Acetone  
Alcohol, A. denat.  
Benzophenone  
Butoxydiglycol  
Butyl acetate  
n-Butyl alcohol  
Butyl myristate, B. stearate  
Butylene glycol  
C9-11 isoparaffin  
C10-11 isoparaffin  
C10-13 isoparaffin  
Caprylic alcohol  
Castor (Ricinus communis) oil  
Cetearyl octanoate  
Cetyl stearyl octanoate  
Chlorobutanol  
Decyl alcohol  
Diethylene glycol  
Diethylene glycol dibenzoate  
Diethyl sebacate  
Diisocetyl adipate  
Diisopropyl adipate, D. sebacate  
Dimethyl phthalate  
Dipropylene glycol

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## Functions

Dipropylene glycol dibenzoate  
 Ethoxydiglycol  
 Ethyl acetate, E. lactate  
 Ethyl myristate, E. oleate  
 2-Ethylhexyl isostearate  
 Glycerin  
 Glycofurf  
 Heptane  
 Hexyl alcohol  
 Hexylene glycol  
 Isobutyl stearate  
 Isocetyl salicylate  
 Isodecyl benzoate, I. isononanoate  
 Isodecyl octanoate, L. oleate  
 Isododecane  
 Isocicosane  
 Isohexadecane  
 Isopropyl alcohol, I. myristate  
 Isostearyl stearyl stearate  
 Laureth-2 acetate  
 Methoxydiglycol  
 Methoxyisopropanol  
 Methyl alcohol  
 Methyl propanediol  
 Methylene chloride  
 MEK  
 MIBK  
 Morpholine  
 Octyl benzoate, O. isononanoate  
 Octyl laurate, O. palmitate  
 Octyldodecyl lactate  
 Olive oil PEG-6 esters  
 Peanut oil PEG-6 esters  
 Pentane  
 Petroleum distillates  
 PEG-6 methyl ether  
 PEG-12  
 PEG-20 hydrogenated castor oil  
 PEG-33 castor oil  
 PEG-50 glyceryl cocoate  
 Polyglyceryl-2 diolate  
 Polyglyceryl-3 diisostearate  
 Polyoxyethylene glycol dibenzoate  
 Polypropylene glycol dibenzoate  
 PPG-2 myristyl ether propionate  
 PPG-3  
 PPG-20 lanolin alcohol ether  
 Propyl alcohol  
 Propylene carbonate  
 Propylene glycol  
 Propylene glycol dibenzoate  
 Propylene glycol methyl ether  
 Propylene glycol myristate  
 Pyridine  
 Sesame (Sesamum indicum) oil  
 Stearyl heptanoate  
 Toluene  
 Xylene

**SPF booster**

Borjoo sorbilis extract  
 Isohexadecyl salicylate  
 Styrene/acrylates copolymer  
 Titanium dioxide  
 Yeast (Saccharomyces cerevisiae) extract (Faex)

**Stabilizer**

Acrylates-VA crosspolymer  
 Acrylates/ceteth-20 methacrylates copolymer  
 Acrylates/steareth-20 methacrylate copolymer  
 Acrylates/vinyl isodecanoate crosspolymer  
 Alkyldimethylamine oxide  
 C10 polycarbamyl polyglycol ester  
 Calcium alginate  
 Cocamidopropyl dimethylamine lactate  
 Cocamine oxide  
 Colloidal silica sols  
 Cyclodextrin  
 Disodium EDTA  
 Gellan gum

Glyceryl diisostearate, G. stearate SE  
 Glyceryl mono-di-n-caprylate  
 Hydrogenated coco-glycerides  
 Hydrogenated C12-18 triglycerides  
 Hydrogenated tallow glycerides  
 Hydrolyzed oat flour  
 Hydroxyoctacosanyl hydroxystearate  
 Karaya (Sterculia urens) gum  
 Laureth-3  
 Maltitol  
 Methylated cyclodextrin  
 Oleamide  
 PEG-40 stearate  
 PEG-40/dodecyl glycol copolymer  
 Perfluoropolyethylisopropyl ether  
 Polyethylene paste  
 PPG-5 lanolin wax  
 PPG-7-buteth-10  
 PPG-10 cetyl ether phosphate  
 Propylene carbonate, P. glycol alginate  
 PVM/MA decadiene crosspolymer  
 Sodium acrylates/vinyl isodecanoate crosspolymer  
 Sodium carbomer  
 Sorbitan laurate  
 Stearic hydrazide  
 2,2',4,4'-Tetrahydroxybenzophenone  
 Tricaprin  
 Tricaprylin  
 Trilaurin  
 Trimyristin  
 Tripalmitin  
 Tristearin

**Stimulant**

Capsicum frutescens extract  
 Eleuthero ginseng (Acanthopanax senticosus) extract  
 Guarana (Paullinia cupana) extract  
 Lactococcus hydrolysate  
 Methylsilanol elastinate  
 Methylsilanol hydroxyproline aspartate  
 TEA-hydroiodide  
 Tocopheryl nicotinate  
 Urocanic acid  
 Yeast (Saccharomyces cerevisiae) extract (Faex)  
 Zedoary (Curcuma zedoaria) oil  
 Zinc DNA

**Sunscreen**

Basil (Basilicum sanctum) oil extract  
 Basil (Ocimum basilicum) extract  
 Benzophenone-3  
 3-Benzylidene camphor  
 Borjoo sorbilis extract  
 C12-15 alkyl benzoate  
 Coffee (Coffea arabica) bean extract  
 Ethyl salicylate  
 Glyceryl PABA  
 Homosalate  
 Hydroquinone-beta-D-glucopyranoside  
 Isoamyl p-methoxycinnamate  
 Isopropylbenzyl salicylate  
 Job's tears (Coix lacryma-jobi) extract  
 Menthyl anthranilate  
 Octyl dimethyl PABA, O. methoxycinnamate  
 Octyl salicylate, O. triazone  
 Oryzanol  
 Pansy (Viola tricolor) extract  
 PEG-25 PABA  
 Phenylbenzimidazole sulfonic acid  
 Rice (Oryza sativa) bran oil  
 TEA-salicylate  
 Titanium dioxide

**Sunscreen UVB**

Benzophenone-3  
 Eclipta alba extract  
 PEG-25 PABA  
 Steareth-100  
 Tridecyl salicylate

**Surfacting agent**

Linoleamide DEA  
 PEG-20 almond glycerides  
 PEG-60 lanolin  
 PEG-75 lanolin

**Surfactant**

Alkyl dimethyl betaine  
 Alkyldimethylamine oxide  
 Ammonium cocoyl sarcosinate  
 Ammonium C12-15 alkyl sulfate  
 Ammonium dimethicone copolyol sulfate  
 Ammonium laureth-5 sulfate  
 Ammonium laureth-12 sulfate  
 Ammonium laureth sulfate  
 Ammonium lauroyl sarcosinate  
 Ammonium lauryl sulfate, A. I. sulfosuccinate  
 Ammonium myreth sulfate  
 Ammonium nonoxynol 4 sulfate  
 Azelamide MEA  
 C10-40 alcohol ethoxylate  
 C10-50 alcohol ethoxylate  
 C40-60 alcohol ethoxylate  
 Calcium dodecylbenzene sulfonate  
 Calcium laurate  
 Cetareth-2 phosphate  
 Cetareth-5 phosphate  
 Cetareth-10 phosphate  
 Cetoleth-25  
 Cetyl betaine, C. phosphate  
 Cocamide MEA ethoxylate  
 Cocamidopropyl betaine, potassium salt  
 Cocamidopropyl betaine ammonium salt  
 Cocamidopropyl hydroxy sulfate  
 Cocamidopropyl hydroxy sulfate, ammonium salt  
 Cocamidopropyl hydroxy sulfate, potassium salt  
 Cocamidopropylamine oxide  
 Coceth-7 carboxylic acid  
 Coco-glucoside  
 Cocoamphodiacetate lauryl-laureth sulfate  
 Cocoamphodiacetate lauryl sulfate  
 Cocoamphodiacetate tridecyl sulfate  
 Coco phosphatidyl PG-dimonium chloride  
 N-Cocoyl-(3-amidopropyl)-N,N-dimethyl-N-ethyl ammonium ethyl sulfate  
 Cocoyl glutamic acid  
 Cocoyl hydrolyzed soy protein  
 Cocoyl hydroxyethyl imidazoline  
 C11-15 pareth-9, -12, -20, -30, -40  
 C12-13 pareth sulfate  
 C12-13 pareth-5 carboxylic acid  
 C12-15 pareth-12  
 C14-15 pareth-8 carboxylic acid  
 DEA-oleth-5-phosphate  
 DEA-oleth-20-phosphate  
 Deceth-3, -6, -8  
 Decyltetradeceth-25  
 Dicetareth-10 phosphoric acid  
 Dimethicone copolyol  
 Dimethicone copolyol almondate, D. c. isostearate  
 Dimethicone copolyol laurate, D. c. olivate  
 Dimethicone copolyol phthalate  
 Dimethicone copolyolamine  
 Dimethicone propyl PG-betaine  
 Dioctyldodeceth-2 lauroyl glutamate  
 Dioctyldodeceth-5 lauroyl glutamate  
 Dioctyldodecyl lauroyl glutamate  
 Disodium capryloamphodiacetate  
 Disodium cocoamphodiacetate  
 Disodium hydrogenated tallow glutamate  
 Disodium laneth-5 sulfosuccinate  
 Disodium lauramide MEA-sulfosuccinate  
 Disodium laureth sulfosuccinate  
 Disodium oleanamide MIPA-sulfosuccinate  
 Disodium oleanamide PEG-2 sulfosuccinate  
 Disodium oleth-3 sulfosuccinate  
 Disodium ricinoleamide MEA-sulfosuccinate  
 Disodium tallamide MEA-sulfosuccinate  
 Distareth-2 lauroyl glutamate

## Functions

Disteareth-5 lauroyl glutamate  
 Ethoxylated fatty alcohol  
 Ethoxylated glycerol sorbitan saturated fatty acid ester  
 Ethoxylated glycerol sorbitan unsaturated fatty acid ester  
 Glycereth-25 PCA isostearate  
 Glycereth-26 phosphate  
 Glyceryl hydroxystearate  
 Hydrogenated tallowyl glutamic acid  
 Isopropyl hydroxybutyramide dimethicone copolyol  
 Lauramidopropyl betaine  
 Laureth-1, -2, -3, -4, -7, -12, -16  
 Laureth-3 carboxylic acid, L. phosphate  
 Laureth-5 carboxylic acid  
 Laureth-11 carboxylic acid  
 Lauryl sarcosine  
 Lauryl dimethylamine cyclocarboxypropylolate  
 Lauryl hydroxyethyl imidazoline  
 Linoleamide DEA  
 Magnesium laureth-8 sulfate  
 Merxapal 105, 171, 172  
 MEA-lauryl sulfate  
 Mixed isopropanolamines myristate  
 Myreth-7  
 Myristoyl sarcosine  
 Myristyl alcohol  
 Nonoxynol-7, -9, -13, -15  
 Nonoxynol-10 carboxylic acid  
 Octoxynol-10, -12  
 Octyldodeceth-10, -16  
 Oleoyl sarcosine  
 Oleth-1 phosphate  
 Oleth-5 phosphate  
 Oleyl betaine  
 Oleyl hydroxyethyl imidazoline  
 Palmamine oxide  
 Palmityl betaine  
 PCA ethyl cocoyl arginate  
 PEG-7 hydrogenated castor oil  
 PEG-8 caprylic/capric glycerides  
 PEG-8 laurate  
 PEG-8 stearate  
 PEG-15 glyceryl stearate  
 PEG-25 glyceryl isostearate  
 PEG-27 lanolin  
 PEG-30 lanolin  
 PEG-40 castor oil  
 PEG-40 glyceryl stearate  
 PEG-40 jojoba oil, P. lanolin  
 PEG-60 glyceryl isostearate, P. g. stearate

PEG-80 jojoba oil, P. sorbitan laurate  
 PEG-120 jojoba oil  
 Penasodium triphosphate  
 Poloxamer 101, 122  
 Polyglyceryl-2 dioleate  
 Polysiloxane-polyether copolymer  
 Potassium cocoyl glycinate  
 Potassium cocoyl hydrolyzed collagen  
 Potassium C9-15 phosphate ester  
 Potassium lauroyl hydrolyzed collagen  
 Potassium lauryl sulfate  
 Potassium myristoyl hydrolyzed collagen  
 Potassium oleoyl hydrolyzed collagen  
 Potassium palmitate  
 Potassium undecylenoyl hydrolyzed collagen  
 PPG-2-isododeceth-4 -6 -9 -12  
 PPG-6 C12-18 pareth-11  
 Protein hydrolysates  
 Quaternium-30  
 Quillaja saponaria extract  
 Raffinose laurate, R. myristate, R. oleate  
 Raffinose palmitate, R. stearate  
 Ricinoleamidopropyl betaine  
 Silicone quaternium-1, -8, -9  
 Sodium alpha olefin sulfonate  
 Sodium cocamidopropyl sulfate  
 Sodium cocoyl hydrolyzed wheat protein  
 Sodium cocoyl isethionate  
 Sodium C12-13 sulfate  
 Sodium C12-14 pareth-2 sulfate  
 Sodium C12-15 pareth-3 sulfonate  
 Sodium C12-15 pareth-7 carboxylate  
 Sodium C12-15 pareth-7 sulfonate  
 Sodium C12-15 pareth-8 carboxylate  
 Sodium C12-15 pareth-13 sulfonate  
 Sodium C12-18 alkyl sulfate  
 Sodium C13-17 alkane sulfonate  
 Sodium C14-16 olefin sulfonate  
 Sodium cetearyl sulfate  
 Sodium cetyl oleyl sulfate  
 Sodium coco-tallow sulfate  
 Sodium cocoyl glutamate  
 Sodium cocoyl hydrolyzed collagen  
 Sodium cocoyl hydrolyzed soy protein  
 Sodium cocoyl sarcosinate  
 Sodium dimethicone copolyol aceryl methylsulfate  
 Sodium hydrogenated tallow glutamate  
 Sodium isodecyl sulfate  
 Sodium laureth-5 carboxylate  
 Sodium laureth-11 carboxylate  
 Sodium laureth-13-carboxylate  
 Sodium laureth sulfate  
 Sodium lauroamphocetate

Sodium lauroyl glutamate  
 Sodium lauroyl hydrolyzed collagen  
 Sodium lauroyl sarcosinate, S. L. taurate  
 Sodium magnesium laureth sulfate  
 Sodium methyl cocoyl taurate  
 Sodium methyl oleyl taurate  
 Sodium myristoyl glutamate  
 Sodium myristoyl hydrolyzed collagen  
 Sodium myristoyl sarcosinate  
 Sodium myristyl sulfate  
 Sodium nonoxynol-6 phosphate  
 Sodium octoxynol-2 ethane sulfonate  
 Sodium oleyl sulfate  
 Sodium oleoyl hydrolyzed collagen  
 Sodium stearyl hydrolyzed collagen  
 Sodium triodecyl sulfate  
 Sodium undecylenoyl hydrolyzed collagen  
 Sodium/TEA-lauroyl hydrolyzed collagen  
 Sodium/TEA-lauroyl hydrolyzed keratin  
 Sorbitan isostearate  
 Stearoyl sarcosine  
 Sulfated castor oil  
 TEA-cocoyl glutamate  
 TEA-cocoyl hydrolyzed collagen  
 TEA-cocoyl hydrolyzed soy protein  
 TEA-C12-15 alkyl sulfate  
 TEA-hydrogenated tallow glutamate  
 TEA-lauroyl glutamate  
 TEA-lauroyl keratin amino acids  
 TEA-lauroyl sarcosinate  
 TEA-lauryl sulfate  
 TEA-myristoyl hydrolyzed collagen  
 Tocophereth-5 -10 -18 -20 -30 -50 -70  
 Trideceth-7 carboxylic acid  
 Trideceth-9  
 Trideceth-19-carboxylic acid  
 Tridecyl ethoxylate  
 Triethanolamine C10-14 sulfate  
 Triisuryl phosphate  
 Wheat germamidopropyl betaine  
 Yucca vera extract  
  
Suspending agent  
 Acrylates/ceteeth-20 methacrylates copolymer  
 Acrylates/steareth-20 methacrylate copolymer  
 Algin  
 Bentonite  
 C10 polycarbonyl polyglycol ester  
 Calcium alginate  
 Carbomer, C. 934  
 Carrageenan (Chondrus crispus)  
 Cellulose gum  
 Cetyl hydroxyethylcellulose

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## Functions

Dihydrogenated tallow phthalic acid amide  
 Diisocyanate phthalic acid amide  
 Guar (Cyanopsis tetragonoloba) gum  
 Hecowine  
 Hydroxypropylcellulose  
 Isobutylene/MA copolymer  
 Magnesium aluminum silicate  
 Methylcellulose  
 Pentasodium triphosphate  
 Polyethylene, P. micronized  
 Propylene glycol alginate  
 Quaternium-18 bentonite  
 Quaternium-18 hectorite  
 Sodium magnesium silicate  
 Sodium polynaphthalenesulfonate  
 Stearalkonium bentonite, S. hectorite  
 Sucareth-10 allyl ether/acrylates copolymer  
 Tragacanth (Astragalus gummi) gum  
 Tribekmin  
 Trihydroxystearin  
 Tris(hydroxymethyl)aminomethyl aluminum silicate  
 Xanthan gum

**Sweetener**

Calcium saccharin  
 Fructose  
 Glycyrrhizic acid  
 Glycyrrhizic acid  
 Glycyrrhizin, ammoniated  
 Hydrolyzed corn starch  
 Lactose  
 Maltitol  
 Mannitol  
 Saccharin  
 Sodium saccharin  
 Sorbitol  
 Sucrose

**Tanning accelerator**

Acetyl tyrosine  
 Carni (Daucus carota) extract  
 Copper acetyl tyrosinate methylsilanol  
 Dihydroxyacetone  
 Disodium methyl tyrosinate  
 Ellipru alba extract in white emulsion  
 Glucose tyrosinate

**Thickener**

Acrylates-VA crosspolymer  
 Acrylates/C10-C30 alkyl acrylate crosspolymer  
 Acrylates/citeth-20 itaconate copolymer  
 Acrylates/citeth-20 methacrylates copolymer  
 Acrylates/steareth-20 itaconate copolymer  
 Acrylates/steareth-20 methacrylate copolymer  
 Acrylates/steareth-30 acrylate copolymer  
 Acrylates/vinyl isodecanoate crosspolymer  
 Acrylic acid/acrylonitrile copolymer  
 Algin  
 Aluminum/magnesium hydroxide stearate  
 Ammonium acrylates/acrylonitrile copolymer  
 Ammonium alginate  
 Arachidyl alcohol  
 Behenic acid  
 Behenyl alcohol, B. behenate  
 Bentonite  
 C10 polyacrylamyl polyglycol ester  
 C12-15 alcohols  
 C12-16 alcohols  
 C18-36 acid

Calcium alginate  
 Calcium carrageenan  
 Caprylic alcohol  
 Carbomer I  
 Carboxymethyl hydroxyethylcellulose  
 Carrageenan (Chondrus crispus)  
 Cellulose, C. gum  
 Cetearyl alcohol, C. behenate  
 Cetearyl octanoate, C. stearate  
 Cetostearyl stearate  
 Cetyl alcohol  
 Cetyl hydroxyethylcellulose  
 Cetyl myristate, C. palmitate  
 Cocamide  
 Cocamide MEA, C. MIPA  
 Cocamidopropylamine oxide  
 Coco-betaine  
 Coco-rapeseedate  
 Cocooleamidopropyl betaine  
 Cocoyl amide hydroxy sulfo betaine  
 Cocoyl monoethanolamide ethoxylate  
 Colloidal silica sols  
 DEA-hydrolyzed lecithin  
 DEA-linoleate  
 DEA-oleth-3 phosphate  
 DEA oleth-10 phosphate  
 Decyl alcohol  
 Dextran  
 Dextrin  
 Dilaureth-10 phosphate  
 Dioleth-8 phosphate  
 DMHF  
 Ethoxylated fatty alcohol  
 Gellan gum  
 Glyceryl behenate, G. stearate  
 Glyceryl polymethacrylate  
 Guar (Cyanopsis tetragonoloba) gum  
 Guar hydroxypropyltrimonium chloride  
 Hectorite  
 Hexyl alcohol  
 Hydrolyzed silica  
 Hydrogenated rapeseed oil  
 Hydrogenated starch hydrolysate  
 Hydrogenated talloweth-60 myristyl glycol  
 Hydrolyzed oat flour  
 Hydrolyzed transgenic collagen  
 Hydroxyethylcellulose  
 Hydroxypropyl chitosan  
 Hydroxypropyl guar  
 Hydroxypropyl methylcellulose  
 Hydroxypropylcellulose  
 Isoceteth-10  
 Isostearamide DEA  
 Isostearamidopropylamine oxide  
 Isostearamphosphopropionate  
 Japica wax  
 Karyx (Stenocilia urens) gum  
 Lecithide DEA, L. MEA, L. MIPA  
 Lecithidopropyl betaine  
 Lecith-10  
 Lecith-linoleic DEA  
 Lecith-linoleoyl diethanolamide  
 Lecith-l-myristoyl diethanolamide  
 Lecithyl alcohol, L. betaine  
 Lecithamide DEA, L. MEA  
 Lactic acid  
 Lactic acid  
 Lactone bean (Coratonia siliqua) gum  
 Magnesium aluminum silicate

MDM hydantoin  
 Methylcellulose  
 Montmorillonite  
 Myristamide DEA, M. MEA  
 Myristamine oxide  
 Myristyl alcohol  
 Octacosanyl stearate  
 Oleamide, O. DEA, O. MEA  
 Palmitamide MEA  
 Pectin  
 PEG-2 laurate  
 PEG-3 distearate, P. lauramide  
 PEG-3 lauramine oxide  
 PEG-4 diisostearate, P. oleamide  
 PEG-5M  
 PEG-6 beeswax  
 PEG-7 hydrogenated castor oil  
 PEG-8  
 PEG-8 dioleate, P. distearate  
 PEG-8 stearate  
 PEG-9M  
 PEG-12 beeswax  
 PEG-18 glyceryl oleate/cocaoate  
 PEG-23M  
 PEG-28 glyceryl tallowate  
 PEG-40 jojoba oil  
 PEG-45M  
 PEG-50 tallow amide  
 PEG-55 propylene glycol oleate  
 PEG-75 stearate  
 PEG-90M  
 PEG-100 stearate  
 PEG-120 methyl glucose dioleate  
 PEG-150 distearate  
 PEG-150 pentaerythrityl tetraestearate  
 PEG-160M  
 PEG-200 glyceryl stearate  
 PEG-200 glyceryl tallowate  
 Pentaerythrityl tetraheptanate  
 Pentaerythrityl tetraoctate  
 Poloxamer 105, 124, 185, 237, 338, 407  
 Polyacrylic acid  
 Polysorbate 20  
 Potassium alginate, P. chloride  
 Potassium oleate, P. stearate  
 PPG-5-citeth-10 phosphate  
 Propylene glycol stearate  
 PVM/MA decadiene crosspolymer  
 PVP  
 Quaternium-18 bentonite  
 Quaternium-18 hectorite  
 Rapeseed oil, ethoxylated high erucic acid  
 Ricinoleamide MEA  
 Sesamide DEA  
 Sodium acrylates/vinyl isodecanoate crosspolymer  
 Sodium carbomer, S. carrageenan  
 Sodium ceteth-13-carboxylate  
 Sodium chloride  
 Sodium magnesium silicate, S. stearate  
 Sorbian sesquiosostearate, S. tristearate  
 Soyamide DEA  
 Soyamidopropyl betaine  
 Starch polyacrylonitrile copolymer-potassium salt  
 Starch polyacrylonitrile copolymer-sodium salt  
 Stearalkonium bentonite, S. hectorite  
 Stearamide  
 Stearamide DEA, S. MEA, S. MEA-stearate  
 Stearamidopropyl dimethylamine lactate  
 Stearamine oxide

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1 BETTER SOURCE

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## Functions

Steareth-10 allyl ether/acrylates copolymer  
 Stearic acid  
 Stearyl alcohol  
 Synthetic beeswax  
 Tallowamide MEA  
 TEA-acrylates/acrylonitril copolymer  
 Tragacanth (*Astragalus gummifer*) gum  
 Triphenol  
 Trihydroxystearin  
 Tromethamine magnesium aluminum silicate  
 Wheat germamide DEA  
 Wheat germamidopropyl betaine  
 Xanthan gum

**Thixotropes**

Bentonite  
 Bentonite  
 Sodium magnesium silicate  
 Stearalkonium bentonite

**Toner**

*Althea officinalis* extract  
 Clover (*Trifolium pratense*) extract  
 Dog rose (*Rosa canina*) hips extract  
 Ginseng (*Panax ginseng*) extract  
 Horsetail extract  
 Lemon bioflavonoids extract  
 Meadowsweet (*Spiraea ulmaria*) extract  
 Nettle (*Urtica dioica*) extract  
 Rose (*Rosa multiflora*) extract  
 Rosemary (*Rosmarinus officinalis*) extract

**UVA absorber**

Benzophenone-1, -2, -3, -4, -6, -8, -9, -11, -12  
 Butyl methoxydibenzoylmethane  
 Corallina officinalis  
 Isopropyl dibenzoylmethane  
 Menthyl anthranilate  
 2,2',4,4'-Tetrahydroxybenzophenone  
 Titanium dioxide  
 Zinc oxide

**UVB absorber**

*Argania spinosa* oil  
 Benzophenone-1, -2, -3, -4, -6, -9, -11  
 Corallina officinalis  
 DEA-methoxycinnamate  
 Drometrizole  
 Ethyl dihydroxypropyl PABA  
 Etoxyerlene  
 Homosalate  
 Isoamyl p-methoxycinnamate  
 Isopropyl methoxycinnamate  
 Isopropylbenzyl salicylate  
 4-Methylbenzylidene camphor  
 Octocrylene  
 Octrizole  
 Octyl dimethyl PABA  
 Octyl methoxycinnamate  
 Octyl salicylate, O. triazone  
 PABA  
 PEG-25 PABA  
 Phenylbenzimidazole sulfonic acid  
 Shea butter, ethoxylated  
 TEA-salicylate  
 Titanium dioxide  
 TriPABA panthenol  
 Zinc oxide

**Vegetable oil**

Apricot (*Prunus armeniaca*) kernel oil  
 Avocado (*Persea gratissima*) oil  
 Baobab oil  
 Calendula officinalis oil  
 Chaulmoogra (*Taraktogenos kurzi*) oil  
 Coconut (*Cocos nucifera*) oil  
 Corn (*Zea mays*) oil  
 Cottonseed (*Gossypium*) oil

Gold of pleasure oil  
 Grape (*Vitis vinifera*) seed oil  
 Hazel (*Corylus avellana*) nut oil  
 Hybrid sunflower (*Helianthus annuus*) oil  
 Hydrogenated coconut oil  
 Hydrogenated cottonseed oil  
 Hydrogenated vegetable oil  
 Jojoba (*Buxus chinensis*) oil  
 Kukui (*Alcurites moluccana*) nut oil  
 Macadamia ternifolia nut oil  
 Meadowfoam (*Limnanthes alba*) seed oil  
 Mexican poppy oil  
 Palm (*Elaeis guineensis*) kernel oil  
 Partially hydrogenated soybean oil  
 Peach (*Prunus persica*) kernel oil  
 Peanut (*Arachis hypogaea*) oil  
 Pecan (*Carya illinoensis*) oil  
 Pumpkin (*Cucurbita pepo*) seed oil  
 Quinoa (*Chenopodium quinoa*) oil  
 Rapeseed (*Brassica campestris*) oil  
 Rice (*Oryza sativa*) bran oil  
 Safflower (*Carthamus unctorius*) oil  
 Seabuckthorn oil  
 Sesame (*Sesamum indicum*) oil  
 Sisymbrium irio oil  
 Soybean (*Glycine soja*) oil  
 Sunflower (*Helianthus annuus*) seed oil  
 Walnut (*Juglans regia*) oil  
 Wheat (*Triticum vulgare*) germ oil  
 Wild borage oil

**Vitamin**

*Aesculus chinensis* extract  
 Ascorbic acid  
 Ascorbic acid polypeptide  
 Ascorbyl palmitate  
 Biotin  
 Calcium pantothenate  
 Cholecalciferol  
 Cyanocobalamin  
 Eclipta alba extract  
 Emblica officinalis extract  
 Equisetum arvense extract  
 Ergocalciferol  
 Esculin  
 Ethyl linoleate  
 Folic acid  
 Laminaria japonica extract  
 Marsilea minuta extract  
 Melaleuca bracteata extract  
 Menadiolone  
 Nasurtium sinensis extract  
 Nelumbium speciosum extract  
 Niacin  
 Niacinamide, N. ascorbate  
 Nicotinamide  
 Nicotinic acid  
 Ocimum basilicum extract  
 Panthenyl triacetate  
 Pantothenic acid  
 Phytonadione  
 Pyridoxine HCl  
 Retinol  
 Retinyl acetate, R. palmitate  
 Retinyl palmitate polypeptide  
 Retinyl propionate  
 Riboflavin tetraacetate  
 Sodium ascorbate  
 Thiamine HCl  
 Tocopherol  
 Tocopheryl acetate, T. succinate

**Wax**

Bayberry (*Myrica cerifera*) wax  
 Behenoxymethicone  
 C16-18 alkyl methicone  
 Candelilla (*Euphorbia cerifera*) wax  
 Carnauba (*Copernicia cerifera*) wax

**Ceratin**

Cetyl dimethicone, C. isooctanoate  
 Dialkyldimethylpolysiloxane  
 Dimethiconol hydroxystearate  
 Dimethiconol stearate  
 Hydrogenated castor oil  
 Hydrogenated cottonseed oil  
 Hydrogenated jojoba oil, H. j. wax  
 Hydrogenated palm kernel oil  
 Hydrogenated rapeseed oil  
 Hydrogenated rice bran wax  
 Hydrogenated vegetable oil  
 Isooctadecyl isononanoate  
 Japan (*Rhus succedanea*) wax  
 Jojoba esters  
 Montan (Montan cera) wax  
 Ouricury wax  
 Ozokerite  
 Polyglyceryl-3 beeswax  
 Spermaceti  
 Stearoxymethicone/dimethicone copolymer  
 Stearoxymethylsilane  
 Synthetic candelilla wax  
 Synthetic carnauba

**Wetting agent**

Benzalkonium chloride  
 Benzethonium chloride  
 Cetalkonium chloride  
 Cetareth-20  
 Cereth-20  
 Cetyl pyridinium chloride  
 Cocamphodipropionic acid  
 Decylglycerol monododecylate  
 Deceth-9  
 Dihydroabietyl methacrylate  
 Dimethicone copolyol methyl ether  
 Dimethicone copolyol phthalate  
 Dioctyl sodium sulfosuccinate  
 Ethyl hydroxymethyl oleyl oxazoline  
 Hydroxylated milk glycerides  
 Isolaureth-6  
 Lanolin acid  
 Lauryl pyrrolidone  
 Lecithin  
 Methyl hydrogenated rosinat  
 Methyl rosinat  
 Nonyl nonoxynol-5  
 Octoxynol-8, 70  
 Oleth-15  
 Oleth-20 phosphate  
 PEG-9 castor oil  
 PEG-15 castor oil  
 PEG-20 glyceryl stearate  
 PEG-20 sorbitan triisostearate  
 PEG-45 palm kernel glycerides  
 PEG-60 almond glycerides, P. corn glycerides  
 PEG-60 shea butter glycerides  
 PEG-70 mango glycerides  
 PEG-75 shorea butter glycerides  
 PEG-80 sorbitan laurate  
 Poloxamer 123, 181, 182, 184, 235, 334  
 Polyether trisiloxane  
 Polyglyceryl-3 oleate  
 Polyglyceryl-6 dioleate  
 Polyglyceryl-10 trioleate  
 Polysorbate 60, 80  
 PPG-2-isodeceth-4, -6, -9, -12  
 PPG-10 lanolin alcohol ether  
 Propylene glycol  
 Sodium butoxyethoxy acetate  
 Sodium capryloamphodihydroxypropylsulfonate  
 Sodium decyl diphenyl ether sulfonate  
 Sodium dodecyl diphenyl ether sulfonate  
 Sodium lauryl sulfate  
 Sulfated castor oil  
 Trisocetyl citrate  
 Trisostearin PEG-6 esters  
 Yucca vera extract

## Claims:

1. A cosmetic composition, comprising:  
a cosmetically acceptable carrier, comprising a reverse thermal viscosifying polymer network comprising at least one poloxamer component randomly bonded to, at least one poly(acrylic acid) component said polymer network capable of aggregation  
5 in response to a change in temperature; and  
a cosmetically active agent which imparts a preselected cosmetic effect, said carrier and said agent disposed within an aqueous-based medium.
2. A cosmetic composition for topical application, comprising:  
10 a cosmetically acceptable carrier, comprising a reverse thermal viscosifying polymer network comprising at least one poloxamer component capable of aggregation in response to a change in temperature randomly bonded to at least one poly(acrylic acid) component; and  
a cosmetically active agent selected to treat imperfections or disorders of the  
15 skin, said carrier and said agent disposed within an aqueous-based medium.
3. The cosmetic composition of claim 1, wherein the cosmetic composition is a shampoo and the cosmetically active agent comprises a cleansing  
20 surfactant.
4. The cosmetic composition of claim 1, wherein the cosmetic composition is a moisturizer and the cosmetically active agent comprises a moisturizer.
- 25 5. The cosmetic composition of claim 1, wherein the cosmetic composition is a sunscreen and the cosmetically active agent comprises a uv-absorbing agent.

6. The cosmetic composition of claim 1, wherein the cosmetic composition is an acne cream and the cosmetically active agent comprises an antiacne agent.

5 7. The cosmetic composition of claim 1, wherein the cosmetic composition is a hair straightener and the cosmetic agent comprises a base for increasing the pH.

10 8. The cosmetic composition of claim 1, wherein the cosmetic composition is a sunless tanning lotion and the cosmetically active agent comprises skin tinting agent.

15 9. The cosmetic composition of claim 1, wherein the cosmetic composition is an antiperspirant and the cosmetically active agent comprises aluminum chlorhydrate.

20 10. The cosmetic composition of claim 1, wherein the cosmetic composition is a shaving cream and the cosmetically active agent comprises an emollient and a foaming surfactant.

11. The cosmetic composition of claim 1, wherein the cosmetic composition is a face cosmetic and the cosmetically active agent comprises a pigment.

*Naqui Lagle*

25 12. The cosmetic composition of claim 1 or 2, wherein the cosmetic agent comprises a hydrophobic material, wherein the cosmetically acceptable carrier stabilizes the hydrophobic material in the aqueous medium.



13. The cosmetic composition of claim 2, wherein said cosmetic agent selected to treat imperfections or disorders of the skin is selected from the group consisting of acidulents, antiacne agents, anti-aging agents, anti-inflammatories, anti-irritants, antioxidants, depilatories, detergents, disinfectants, emollients, exfoliants, humectants, lubricants, moisturizers, skin conditioners, skin protectants, skin lightening agents, skin soothing agents, sunscreens, tanning accelerators and mixtures thereof.

14. The composition of claim 4, wherein said composition further comprises a cosmetic agent selected from the group consisting of humectants and emollients.

15. The composition of claim 1 or 2, further comprising one or more additives selected from the group consisting of preservatives, abrasives, acidulents, antiacne agents, anti-aging agents, antibacterials, anticaking, anticaries agents, anticellulites, antidandruff, antifungal, anti-inflammatories, anti-irritants, antimicrobials, antioxidants, astringents, antiperspirants, antiseptics, antistatic agents, antrngents, binders, buffers, additional carriers, chelators, cell stimulants, cleansing agents, conditioners, deodorants, depilatories, detergents, dispersants, emollients, emulsifiers, enzymes, essential oils, exfoliants, fibers, film forming agents, fixatives, foaming agents, foam stabilizers, foam boosters, fungicides, gellants, glosser, hair conditioner, hair set resins, hair sheen agents, hair waving agents, humectants, lubricants, moisture barrier agents, moisturizers, ointment bases, opacifier, plasticizer, polish, polymers, powders, propellant, protein, refatting agents, sequestrant, silicones, skin calming agents, skin cleansers, skin conditioners, skin healing, skin lightening agents, skin protectants, skin smoothing agents, skin softening agents, skin soothing agents, stabilizers, sunscreen agents, surfactants, suspending agents, tanning accelerators, thickeners, vitamins, waxes, wetting agents, liquefiers, colors, flavors and/or fragrances

16. The composition of claim 1, wherein the cosmetic composition takes a form selected from the group consisting of lotions, creams, sticks, roll-on formulations, mousses, sprays, aerosols, pad-applied formulations and masks.

5 17. The composition of claim 1, wherein the viscosification occurs at a temperature in the range of about 27 to 40°C.

18. The composition of claim 1, wherein the viscosification occurs at a temperature in the range of about 30 to 37°C.

10

19. The composition of claim 1, wherein said composition is formulated as a product selected from the group consisting of baby products, baby shampoos, lotions, powders and creams; bath preparations, bath oils, tablets and salts, bubble baths, bath fragrances bath capsules; eye makeup preparations, eyebrow pencil, eyeliner, eye shadow, eye lotion, eye makeup remover, mascara; fragrance  
15 preparations, colognes, toilet waters, powders and sachets; noncoloring hair preparations, hair conditioner, hair spray, hair straighteners, permanent waves, rinses, shampoos, tonics, dressings and other grooming aids; color cosmetics; hair coloring preparations, hair dye, hair tints, hair color sprays, hair lighteners and hair bleaches; makeup preparations, face powders, foundations, leg and body paints, lipstick makeup  
20 bases, rouges and makeup fixatives; manicuring preparations, basecoats, undercoats, cuticle softeners, nail creams, nail extenders, nail polish and enamel, and remover; oral hygiene products, dentrifices, mouthwashes; personal cleanliness, bath soaps, detergents, deodorants, douches and feminine hygiene product; shaving preparations, aftershave lotion, beard softeners, men's talcum, shaving cream, shaving soap,  
25 preshave lotions; skin care preparations, skin cleansing preparations, skin antiseptics, depilatories, face and neck cleansers, body and hand cleansers, foot powders; moisturizers, night preparations, paste masks, skin fresheners; and suntan preparations, suntan creams, gels and lotions, and indoor tanning preparations.

20. The cosmetic composition of claim 1 or 2, wherein the poloxamer component is present in an amount in the range of about 0.01 to 20 wt% and the poly(acrylic acid component) is present in the amount of about 0.01 to 20 wt%.

5 21. The cosmetic composition of claim 1, wherein the polymer network comprises a plurality of poloxamers.

22. The cosmetic composition of claim 1, wherein the polymer network comprises a plurality of poloxamer components randomly bonded to a poly(acrylic acid) backbone.  
10

23. The cosmetic composition of claim 1, wherein the reversibly viscosifying polymer composition comprises a plurality of poly(acrylic acid) components randomly bonded to a poloxamer component.  
15

24. The cosmetic composition of claim 1, wherein the aqueous-based medium is selected from the group consisting of water, salt solutions and water with water-miscible organic compound(s).

20 25. The cosmetic composition of claim 1, further comprising an additive selected to increase transition temperature and increase viscosity of the reversible viscosifying polymer network.

25 26. The cosmetic composition of claim 1, further comprising an additive selected to increase transition temperature and decrease viscosity of the reversible viscosifying polymer network.

27. The cosmetic composition of claim 1, further comprising an additive selected to increase transition temperature without affecting viscosity of the reversible viscosifying polymer network..

5 28. The cosmetic composition of claim 1, further comprising an additive selected to decrease transition temperature and increase viscosity of the reversible viscosifying polymer network.

10 29. The cosmetic composition of claim 1, further comprising an additive selected to decrease transition temperature and decrease viscosity of the reversible viscosifying polymer network.

15 30. The cosmetic composition of claim 1, further comprising an additive selected to decrease transition temperature without affecting viscosity of the reversible viscosifying polymer network.

20 31. The cosmetic composition of claim 1, further comprising an additive selected to increase viscosity without affecting transition temperature of the reversible viscosifying polymer network.

32. The cosmetic composition of claim 1, further comprising an additive selected to decrease viscosity without affecting transition temperature of the reversible viscosifying polymer network.

25 33. The cosmetic composition of claim 1 or 2, characterized in that the gel remains translucent to light before and after response to the environmental stimulus.

34. The cosmetic composition of claim 1, wherein the poly(acrylic acid) is branched.

35. Method of making an cosmetic composition, comprising:  
5 dissolving a poloxamer capable of aggregation in response to a change in temperature in acrylic acid monomer;  
initiating polymerization of the monomer to form a poly(acrylic acid) randomly bonded to the poloxamer, so as to form a reversibly viscosifying polymer composition;  
10 mixing the reversibly gelling polymer compositions with a cosmetic agent which imparts a desired cosmetic effect to the composition.

36. The method of claim 36, wherein a polymerization initiator is selected to provide the polymer network having a selected temperature of viscosification.

15 37. The method of claim 36, wherein one or more poloxamers are added.

38. The cosmetic composition of claim 1, wherein the reversibly viscosifying polymer network is present in an amount in the range of 0.01% 10%.

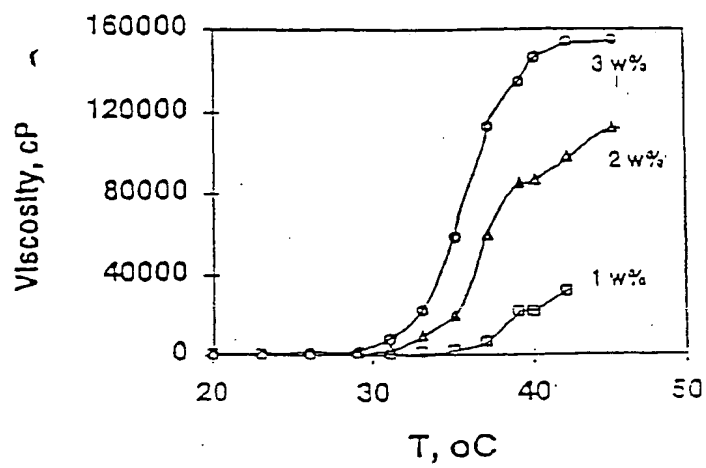


Figure 1.

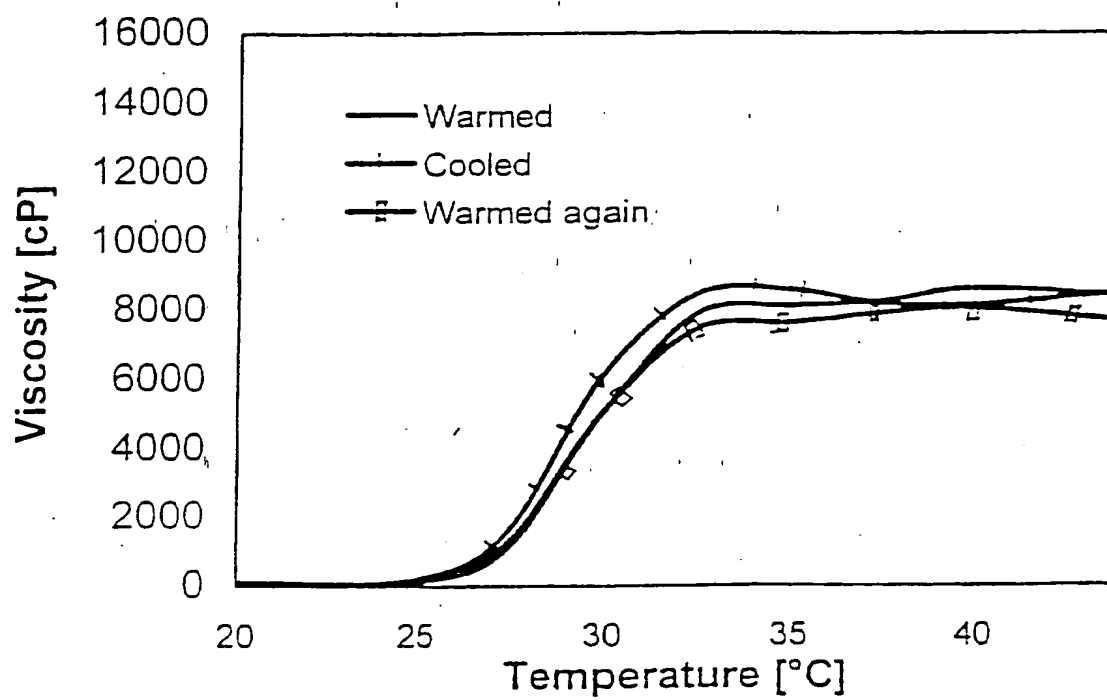


Figure 2

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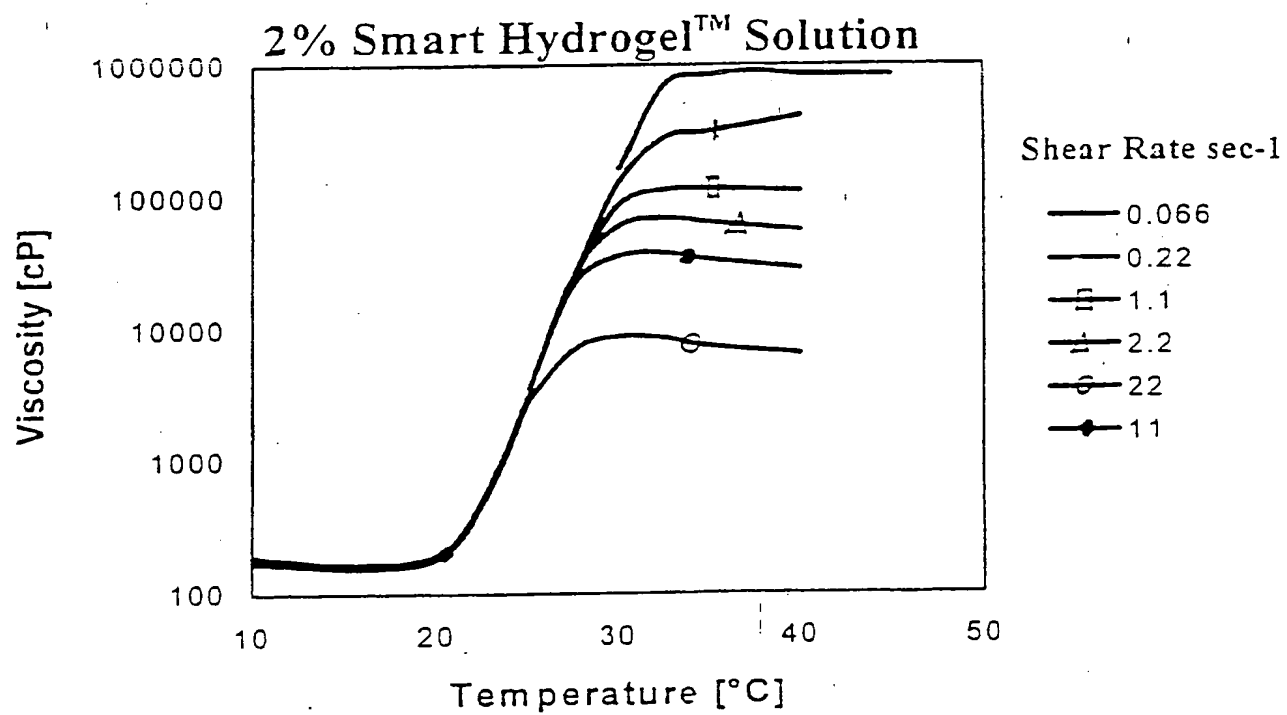


Figure 3



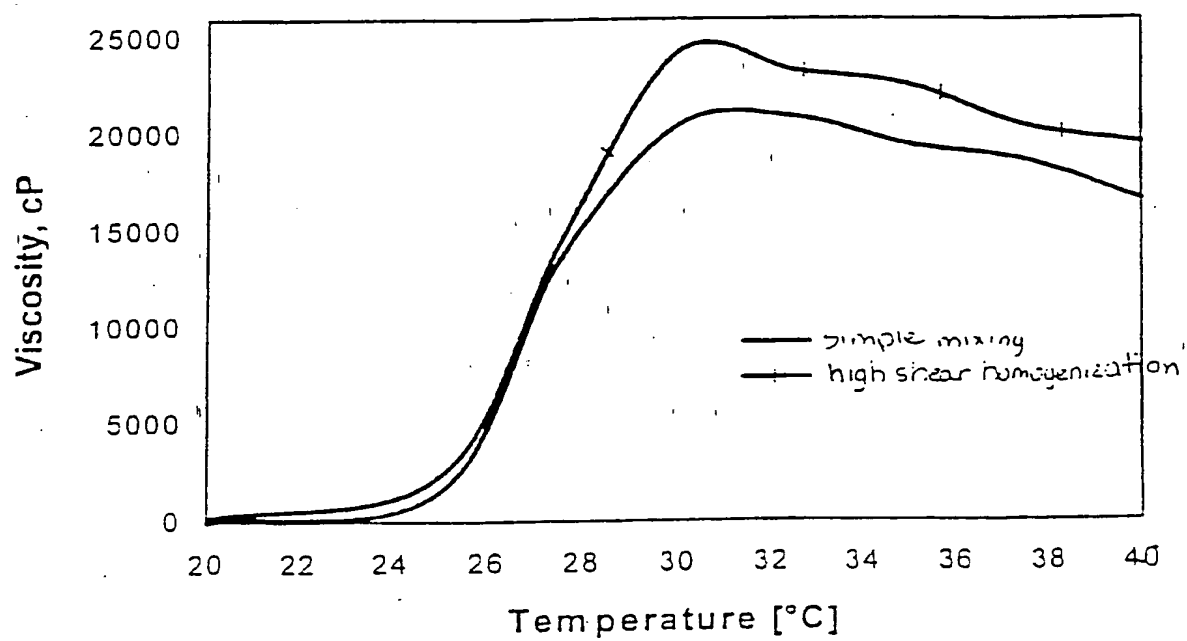


Figure 4

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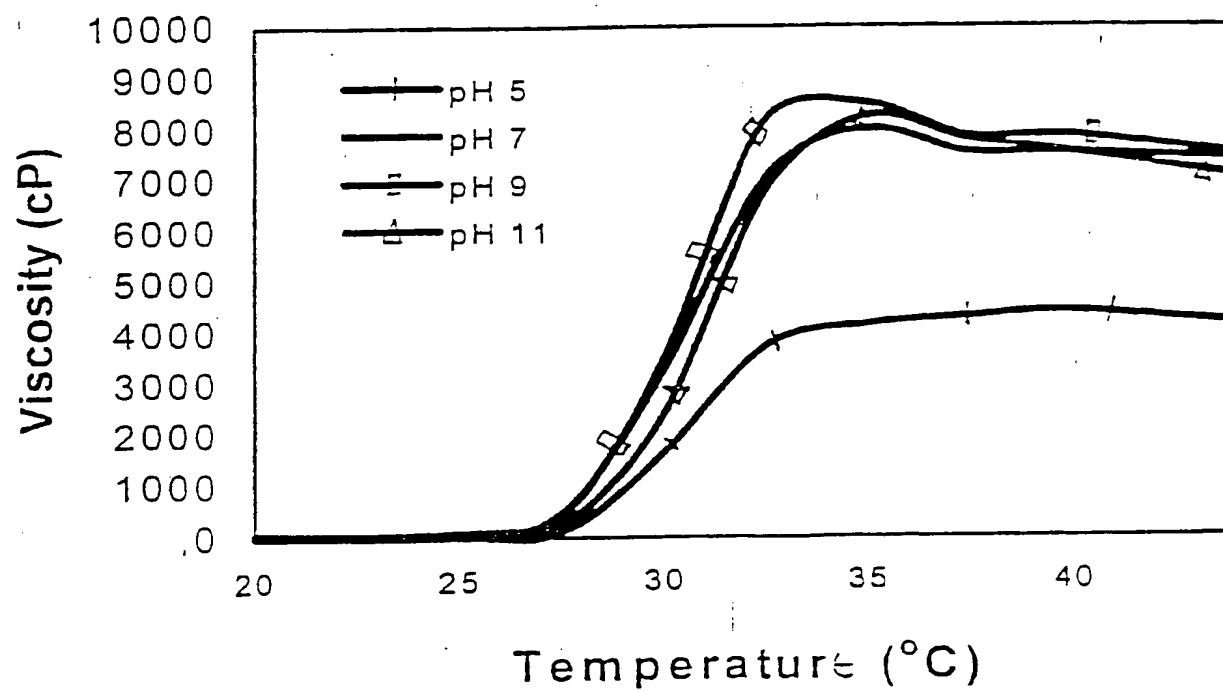


Figure 5

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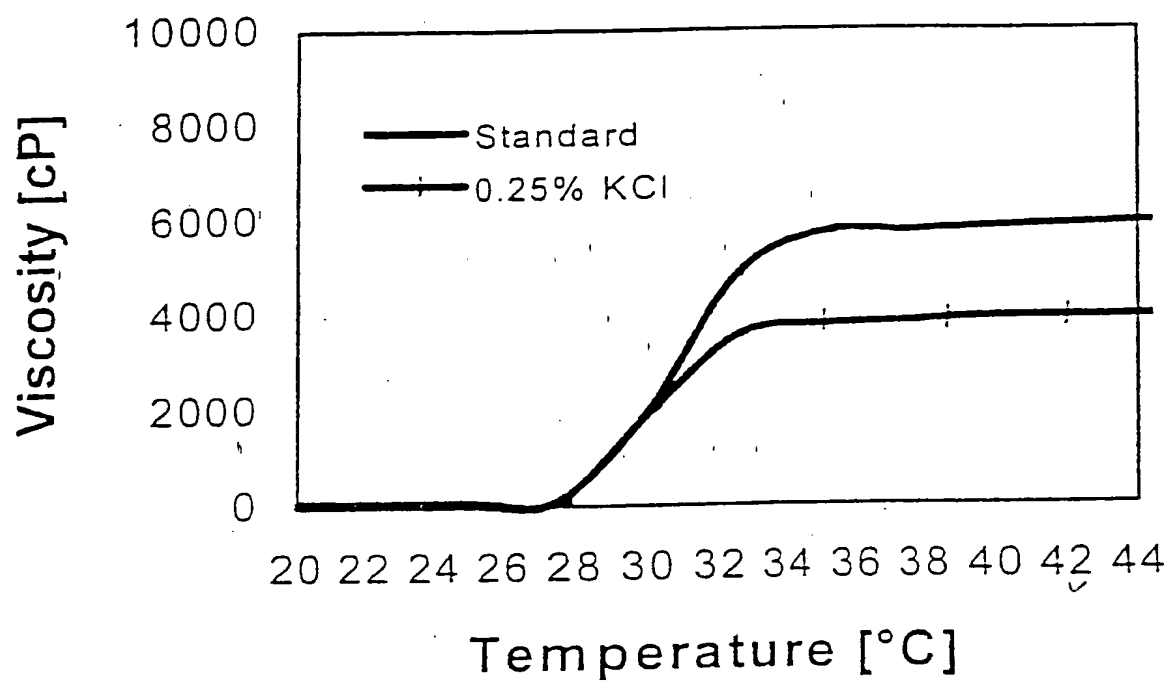


Figure 6

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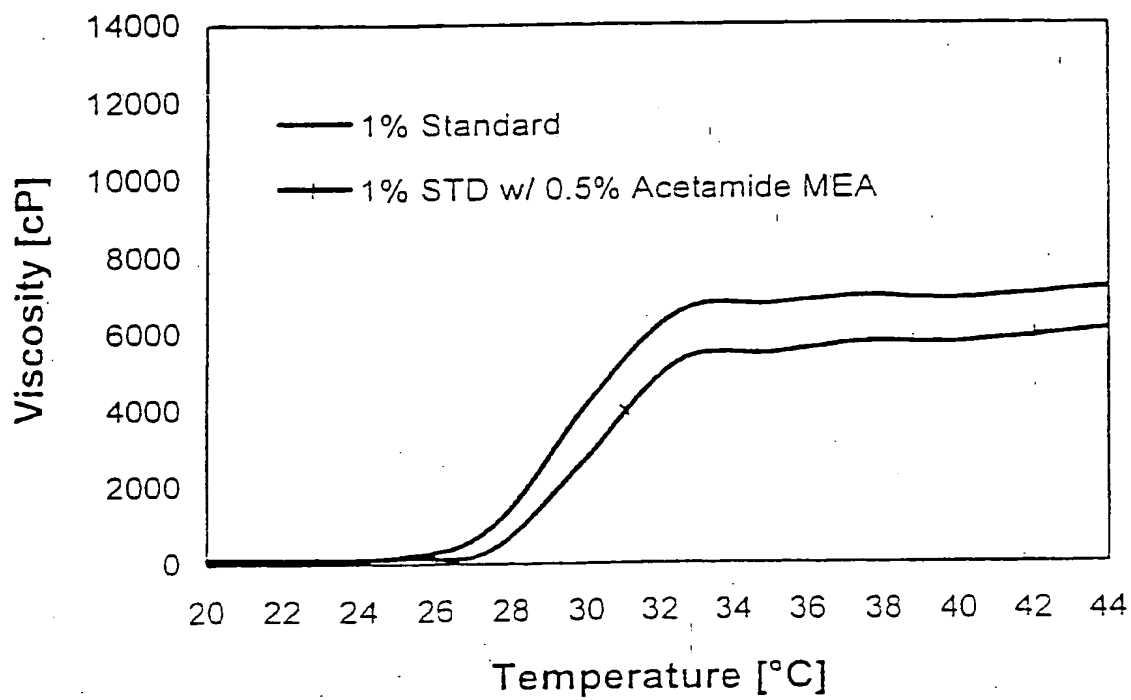


Figure 7

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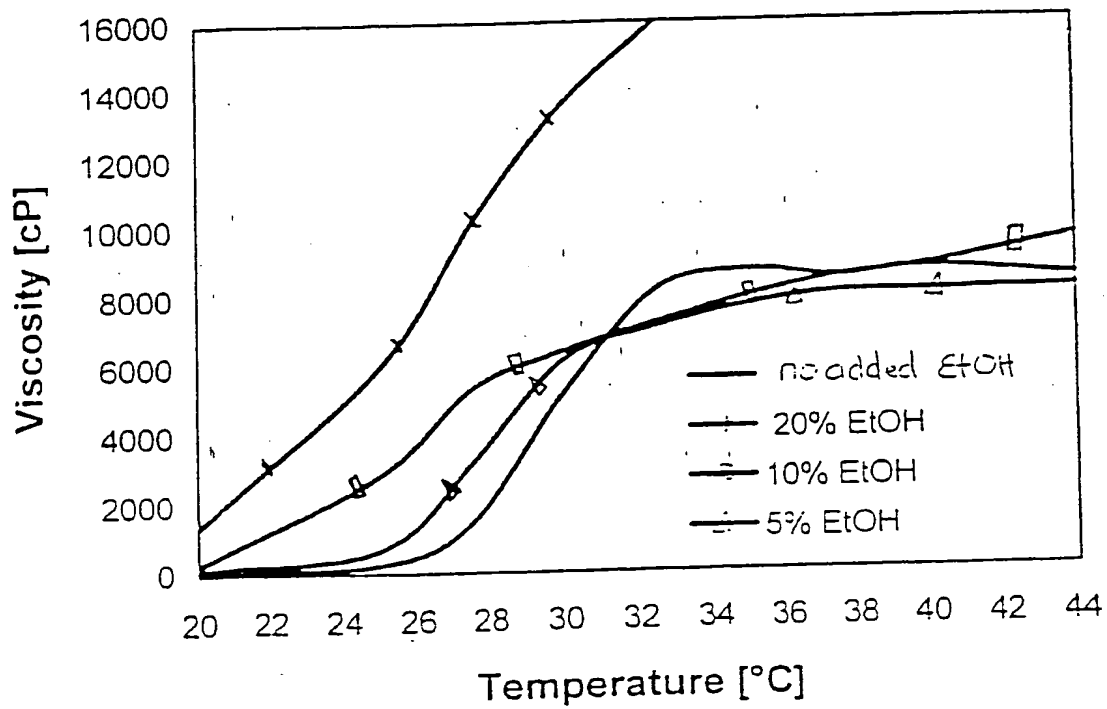


Figure 8

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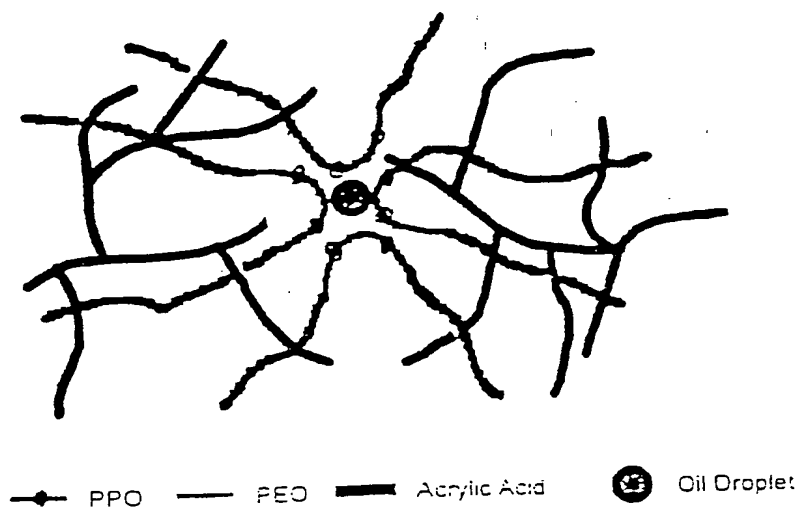
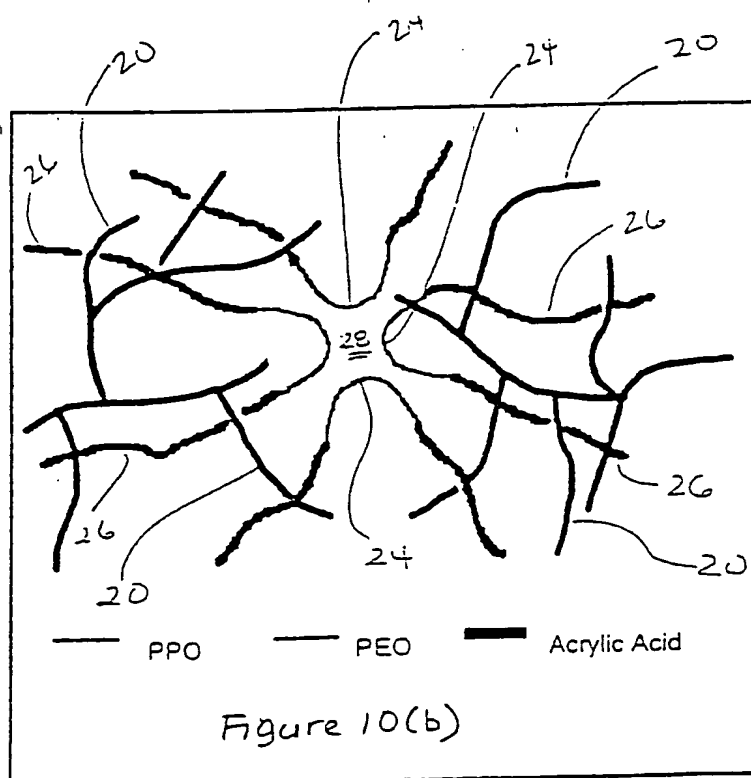
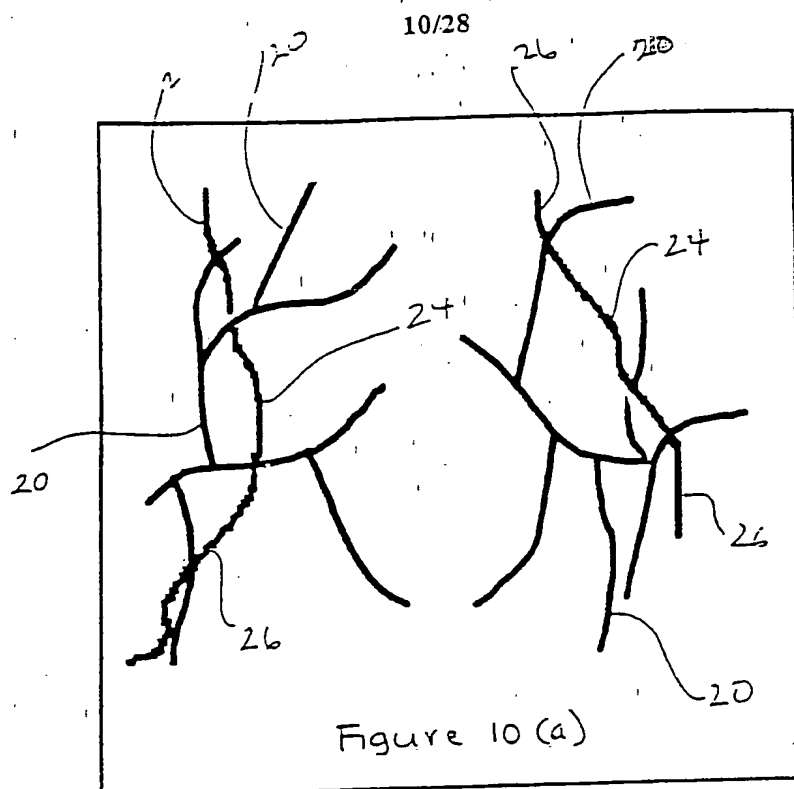


Figure 9



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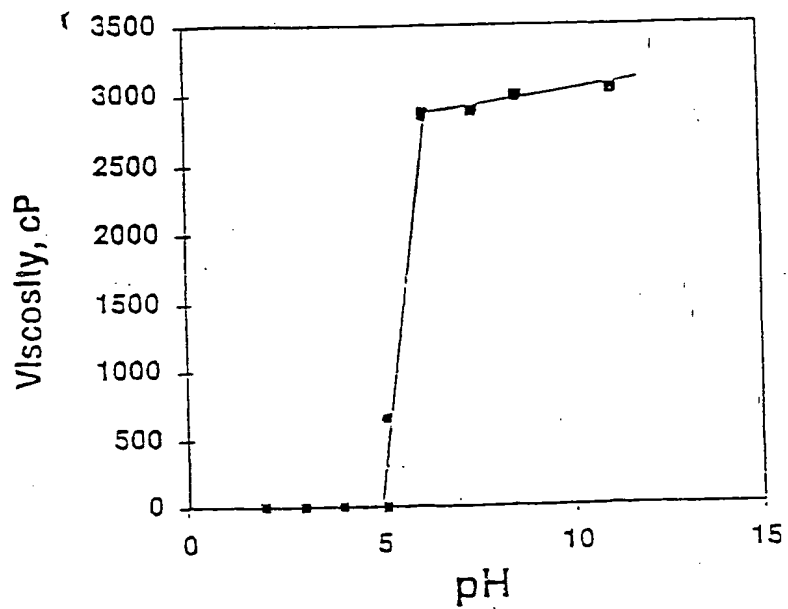


Figure 11



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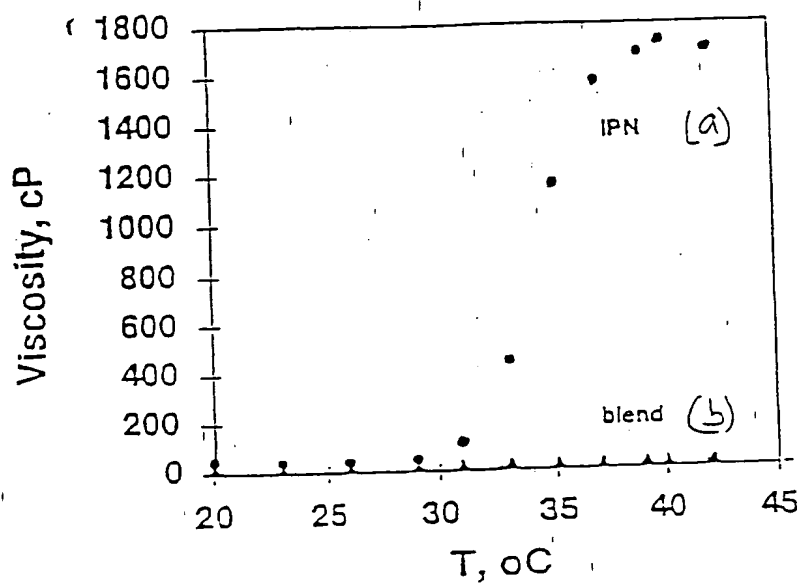


Figure 12

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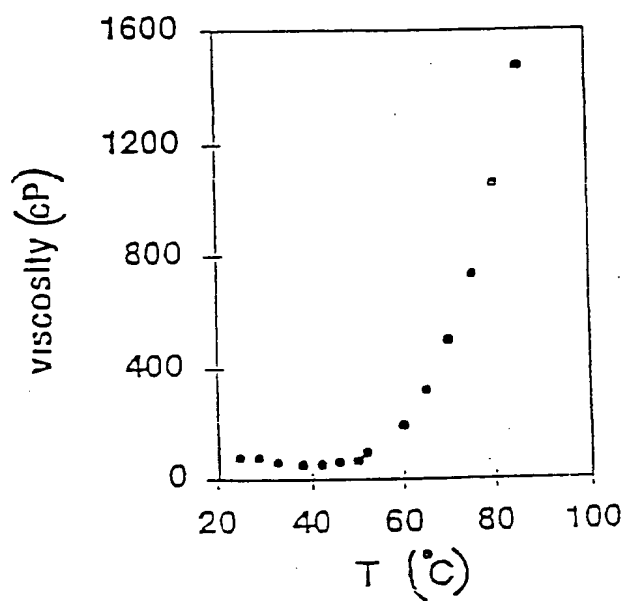


Figure 13

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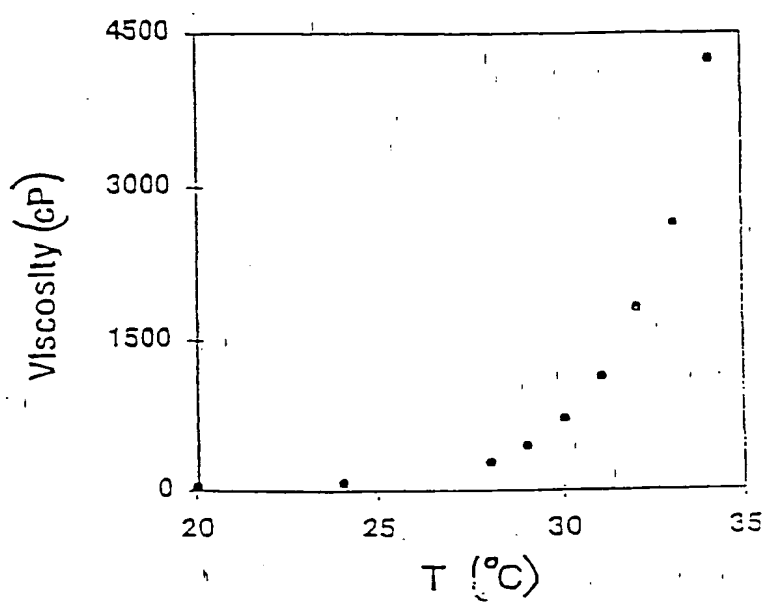


Figure 14

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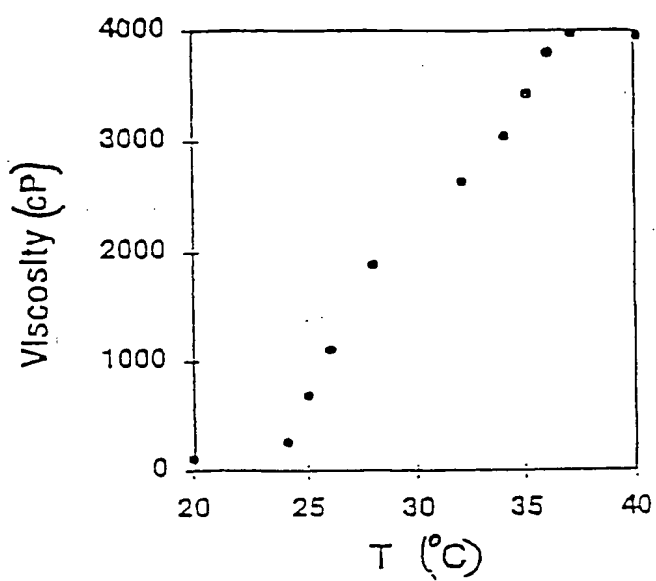


Figure 15

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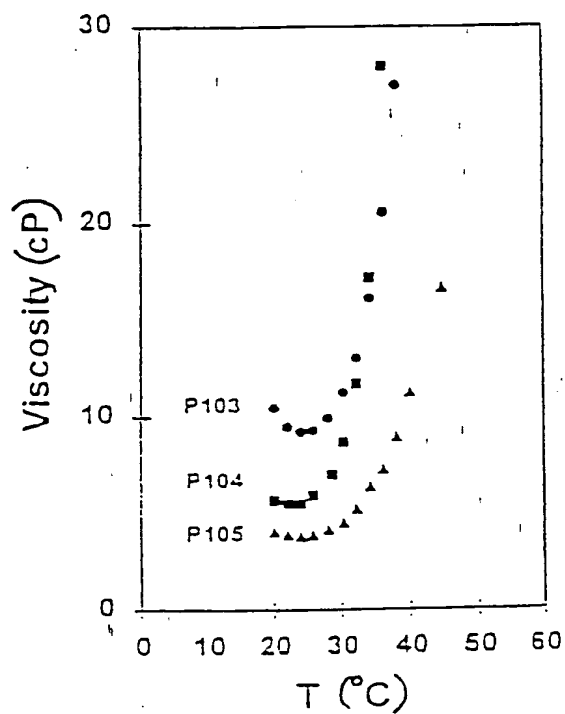


Figure 16

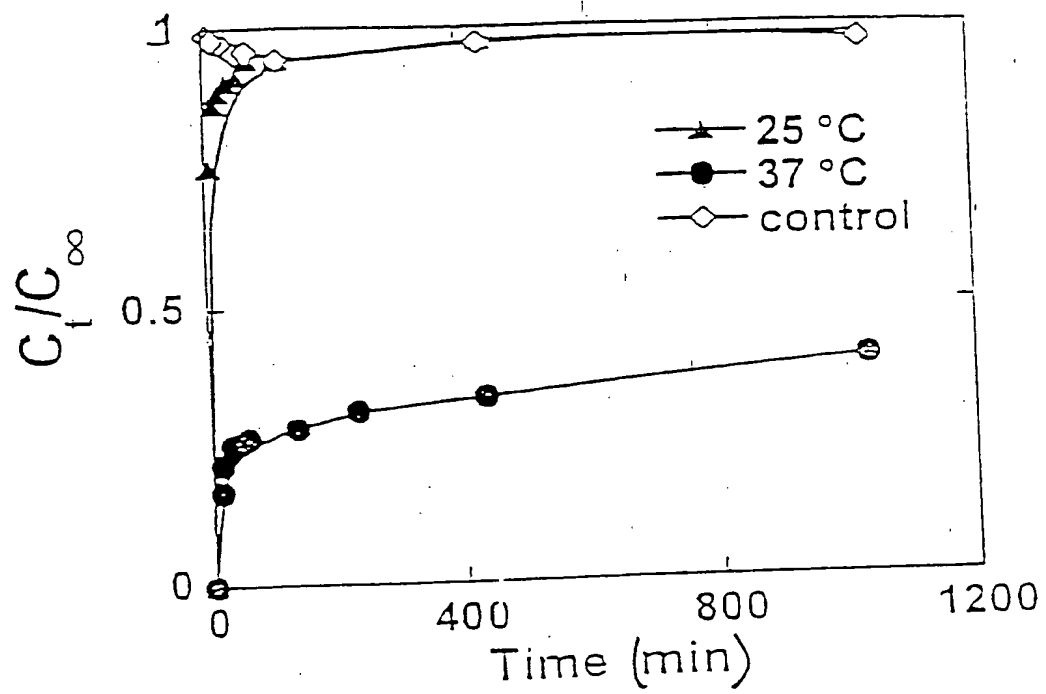


Figure 17

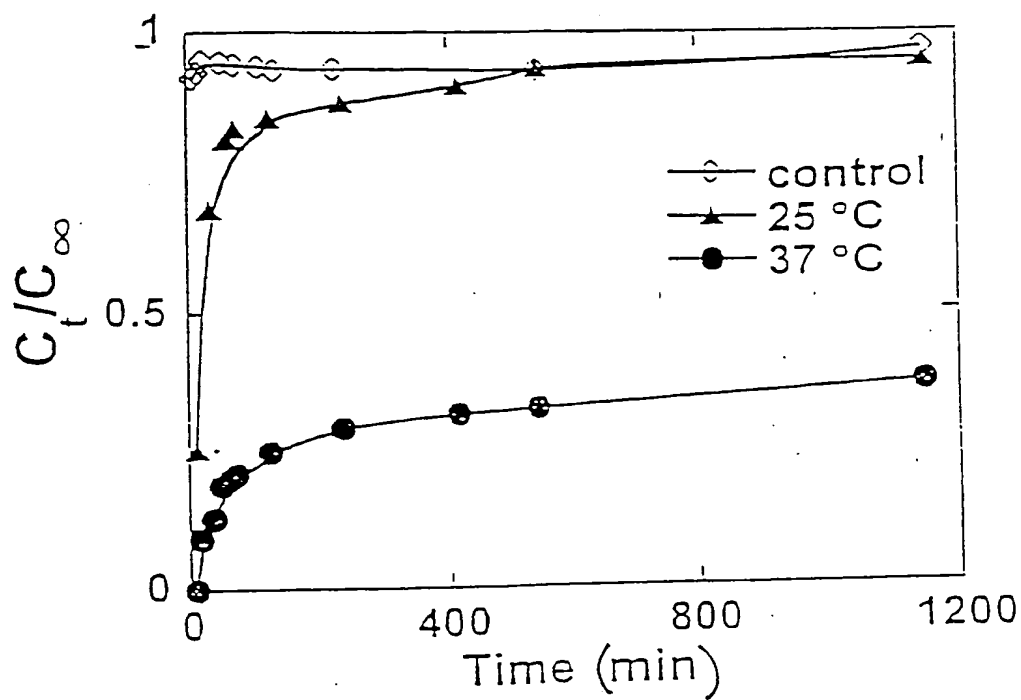


Figure 18

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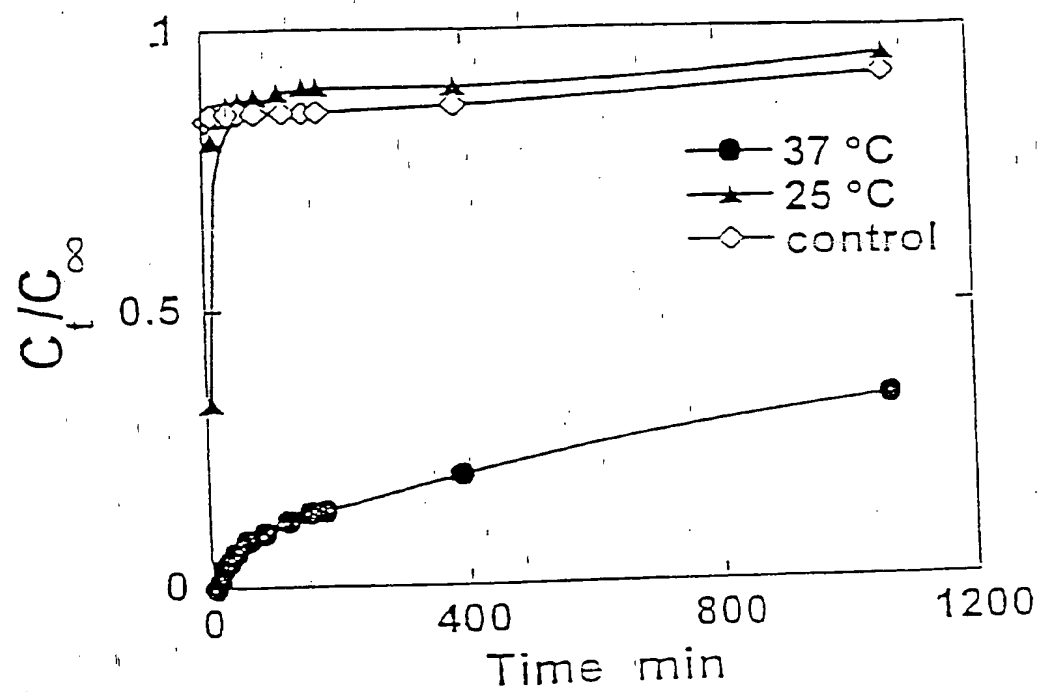


Figure 19



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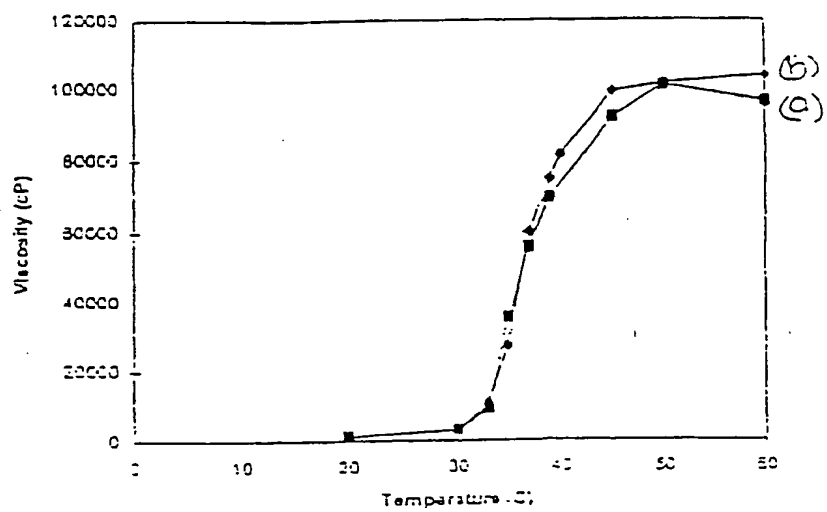


Figure 20

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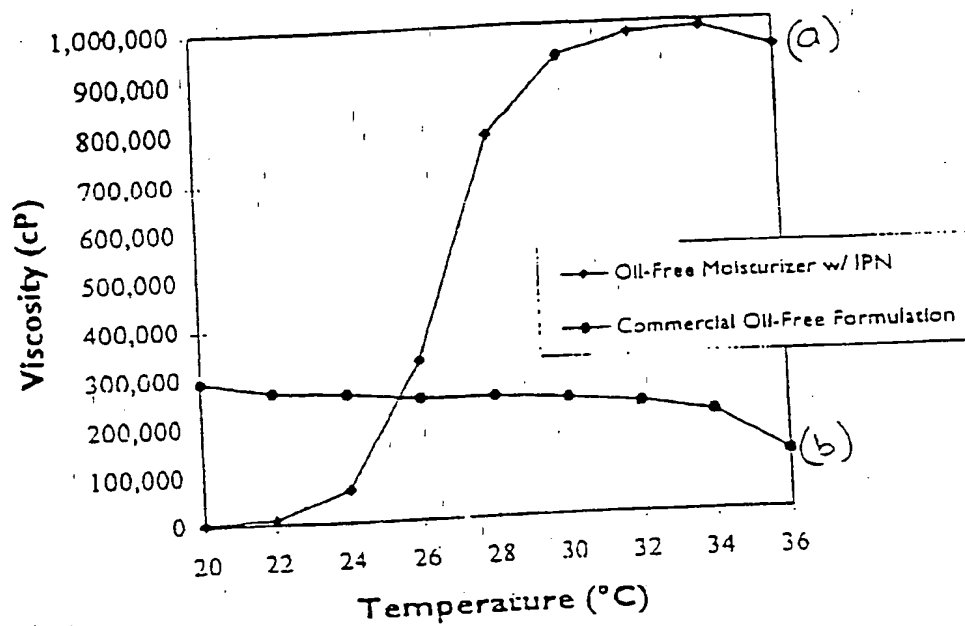


Figure 21

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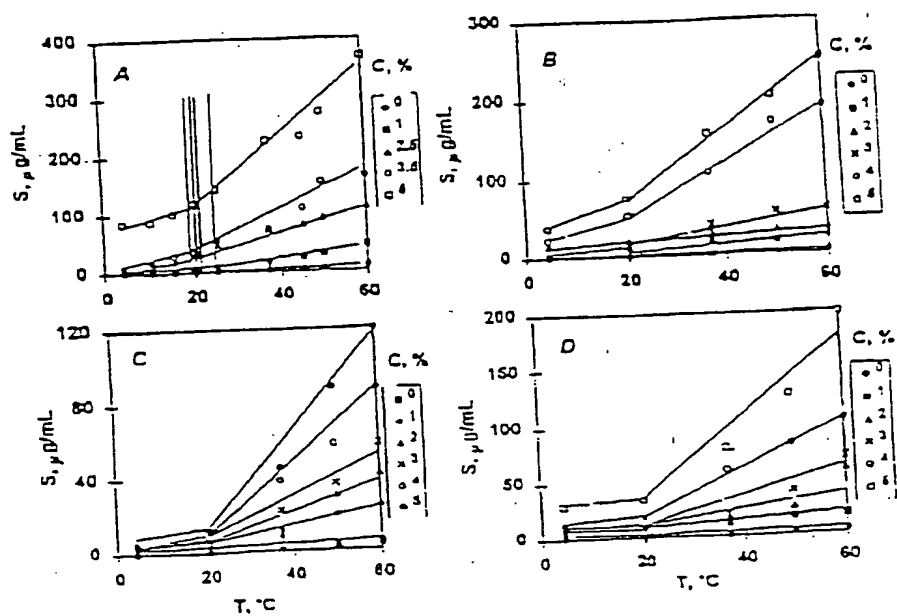


Figure 22

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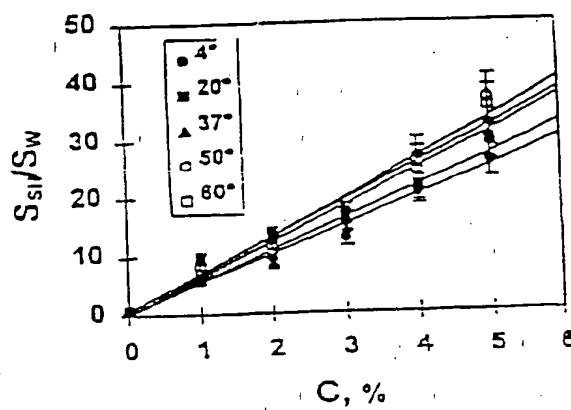


Figure 23

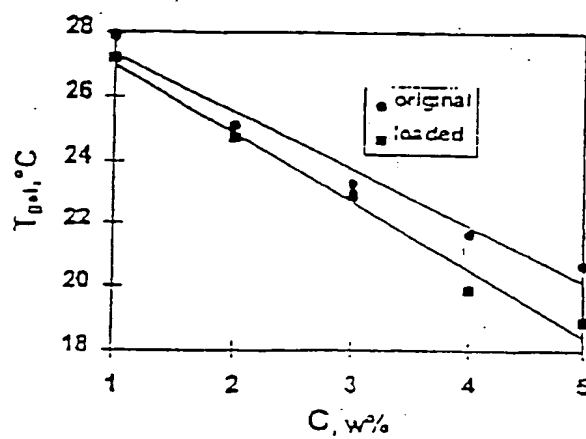
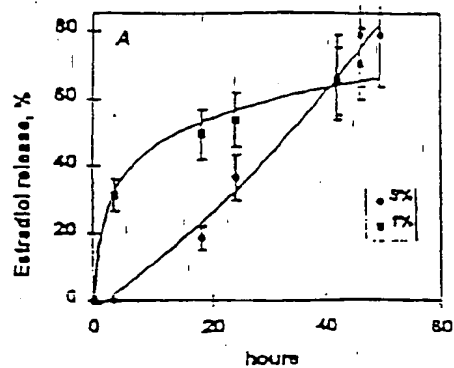
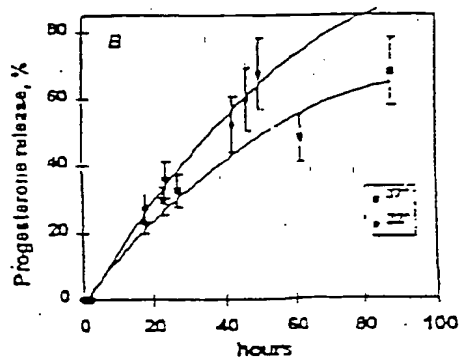


Figure 24

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a



b

Figure 25

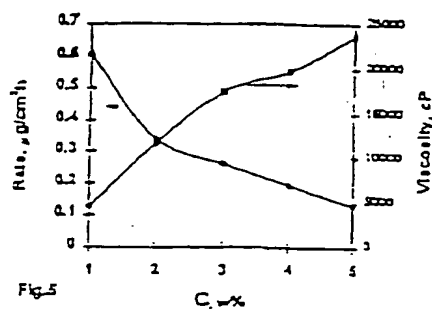


Figure 26

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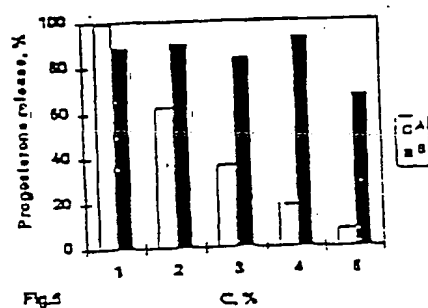


Figure 27



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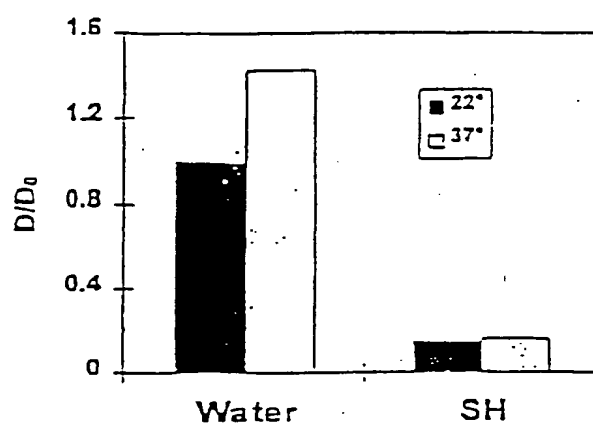


Figure 28

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US98/08931

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : A61K 7/00, 7/021, 7/025, 7/06, 7/09, 7/16, 7/32, 7/42, 31/74

US CL : Please See Extra Sheet

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 424/49, 59, 63, 64, 65, 70.1, 70.2, 70.7, 78.02, 70.08, 400, 401, 405

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS: COSMETIC, POLYACRYLIC ACID, POLYMER NETWORK, POLOXAMER

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A, P	US 5,662,892 A (BOLICH, JR. et al.) 02 September 1997, see entire document.	1-38
Y	US 5,106,609 A (BOLICH, JR et al.) 21 April 1992, see entire document.	1-38

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

-	Special categories of cited documents:	*T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A*	document defining the general state of the art which is not considered to be of particular relevance	*X*	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E*	earlier document published on or after the international filing date	*Y*	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*I*	document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*A*	document member of the same patent family
*O*	document referring to an oral disclosure, use, exhibition or other means		
*P*	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

03 AUGUST 1998

Date of mailing of the international search report

02 OCT 1998

Name and mailing address of the ISA/US  
Commissioner of Patents and TrademarksBox PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

SHELLEY A. DODSON

Telephone No. (703) 305-1235

Form PCT/ISA/210 (second sheet)(July 1992)\*

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US98/08931

A. CLASSIFICATION OF SUBJECT MATTER:  
US CL : 424/49, 59, 63, 64, 65, 70.1, 70.2, 70.7, 78.02, 70.08, 400, 401, 405

Form PCT/ISA/210 (extra sheet)(July 1992)\*

